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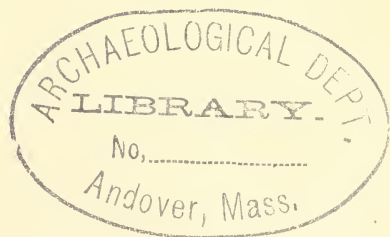
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## THE ARCHÆOLOGIST

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# The Archæologist.

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NO. 1.

## ARCHÆOLOGY OF PERU.

[BY GEORGE A. DORSEY.]



THE west coast of South America is easily reached in a voyage of about twenty days from New York by way of Panama. The steamers of the Pacific Mail Steamship Co. leave New York every ten days. Connection is made at Panama with the steamers of the Pacific Steam Navigation Company or the *Compania de Vapores en Sud America*. These steamers sail weekly from Panama to Valparaiso touching at all important points on the west coast. They have been built especially for south Pacific travel and their fleets number many of the finest vessels of the world. The journey from Panama to Callao occupies six days, the principal stop being at Guayaquil. The traveler for Peru naturally makes Callao the starting point as it is the seaport of Lima, and by far the most important in all Peru. From Lima there is a railroad to Oroya on the Amazon slope of the Andes distant one hundred and thirty miles from the coast. From Oroya journeying into the interior to whatsoever point is accomplished by mules. Points on the coast above and below Callao are reached by the coasting steamers of the above mentioned lines. The interior of the southern portion of Peru is easily reached by a railroad from Mollendo which proceeds directly to Puno on the west shore of Lake Titicaca. From Puno there is also a branch to Sicuani, distant only eighty miles from Cuzco. There are a number of small railroads in the northern part of Peru but they serve merely a local purpose and none of them are more than fifty miles in length. The most prominent of these is the one from Payta to Piura. Practically all of the railroads of Peru have been built by American engineers and are provided with American equipment.

To the archæologist, however, or one in search of the ancient ruins of Peru the mule furnishes the only means of transportation. This method of traveling is of necessity laborious and expensive. The requisite equipment for an ordinary journey into the interior or to any portion of Peru distant from the coast consists of riding mules, cargo mules, an *arriero* or attendant who provides for all of the necessities of the journey. In general food and shelter can be obtained on the road so that it rarely becomes necessary to take any extended stock of provisions.

For convenience Peru may be roughly divided into three divisions each

possessing peculiar characteristics and a different fauna and flora. The first is known as the coast region. It is comprised between the extreme northern and southern boundaries of Peru and has for its western boundary the Pacific ocean, its eastern the Cordillera. It averages forty miles in width, is never less than twenty in width or more than eighty. Throughout this vast region rain is never known to fall. The surface is generally level, and except where artificially watered is absolutely barren and is generally strewn with *medanos* or sand dunes. This desert at intervals of twenty or thirty miles is crossed by rivers which have their origin in the melting snows of the lofty Andes. The longest of these rivers is that of the Santa in the northern part of Peru and is only one hundred and twenty miles in length. In ancient times, as today, the greater part of the volume of water is diverted from its course by means of the *azequias* or irrigating canals. These *azequias* are often many miles in extent and those of ancient times were so well constructed that they are still in use today. The valleys when thus artificially watered are wonderfully fertile and in them can be produced all products of the sub-tropical zone. The temperature throughout this entire region is greatly modified by the near presence to the coast of the south Antarctic stream and which has a tendency to produce an even temperature throughout the entire year. The temperature never rises above 85 degrees in the dry season, nor falls below 60 degrees in the wet season. During the wet season there generally prevails what is known as the *garwa*, which takes the form of a very dense mist. This is the best season of the year for all archæological work on the coast as the fog breaks the force of the tropical sun.

The second natural division of Peru is that shut in by the eastern and western ranges of the Andes. It extends the entire length of Peru, and while in the north it is divided up into deep valleys, throughout the central and southern portions assumes the character of an elevated plateau. In the southern part of Peru this plateau has an elevation of about 13,000 feet and is four hundred miles broad. Throughout this entire region rain frequently falls and the more elevated parts are swept by fierce snow storms. The natural products of this region may be in general likened to those of the cold portion of the temperate zone. In the deeper valleys, however, the climate during the entire year is like that of southern Italy and sugar cane and similar products are extensively cultivated. The more elevated portions, however, are almost entirely barren, and affording only scanty pasturage for the wild herds of the vicuña, alpaca, and guanaco. Minerals are rarely found in this region except in the upper valleys where small quantities of gold, silver, and copper have been brought down by the mountain torrents.

The third region of Peru is that of the Montaña, or forest region. It begins with the eastern slope of the east Cordillera and is only bounded by the Brazilian forests of the Amazon. This region is densely wooded, but little known, and has always been the haunt of innumerable tribes of savage Indians who have never been conquered either by the Incas or by the Spaniards and for the archæologist possesses but little interest. Gold, silver, and copper abound in large quantities throughout the entire region.

The student of archæology is concerned only with the first two divisions, for it is in these regions that the remains of the ancient Peruvian race abound in such large quantities. Throughout the entire region there is scarcely a plain



on the coast or a valley in the mountains that does not contain one or more systems of ruins. The methods of procedure in the examination of these ruins is about the same. Having arrived at the ruin or burying ground the first thing necessary is to secure accommodations for food and shelter. In some localities there are small towns near at hand where one can always find a reasonably good *tienda* or hotel. In other places it frequently becomes necessary to take up quarters at a distance from the scene of operations. If the place is on the coast an ox-cart can generally be secured to transport whatever material may be excavated. In the interior, however, only burros or pack-mules can be used. Good native labor can be secured at reasonable prices. The men almost invariably have had previous experience and many of them style themselves *huaceros*, or one who works in *huacas*, as old ruins and cemeteries in Peru are called. Archaeological work both on the coast and interior has so far been almost exclusively confined to excavations in the burying grounds, very little attention having been paid to the ruins themselves, and it is highly probable that the work yet to be accomplished in the latter will yield many entirely new and valuable results.

Having located the burying ground the only instruments necessary are shovels and a steel rod. The steel rod is used in locating the individual graves. It has been previously stated that the surface of the coast is in general an absolute desert. It consists of a stratum of pure sand of about a foot in depth. This sand is ever moving and shifting. Beneath this top stratum is found a hard, cement-like gravel deposited in geological times by the sea. Wherever this gravel has been disturbed it naturally remains loose. Armed with the steel rod then, the *huaciero* repeatedly thrusts it into the loose sand until he comes to a place where no resistance is offered by the gravel and he is enabled to thrust the rod downward its entire length. Wherever such a spot is found it is highly probable that a grave has been located. The depth of the graves vary in different localities, the most shallow ones being but two feet in depth, the very profound ones being of a greater depth than twenty feet. Fortunately for the archaeologist the custom of burying the dead on the same side of the grave has been found to be the same all over the coast. Keeping this fact in mind it is easy to enter the grave at the side without disturbing the bundle or the various objects which have been buried with it. To remove the bundle and prepare it for transportation so as to keep it intact is one of the most serious problems of the entire work. After repeated experiments I hit upon the plan of enlarging the grave to twice or three times its original size before the contents have been disturbed. I then spread upon the bottom a piece of burlap of double width covered with straw. The bundle was then carefully lifted and laid upon the bed so formed. The ends of the burlap were then gathered over the top and the whole was sewed up into a compact bundle. This then could be safely lifted from the grave and carried to the scene of packing. The method of procedure here described, however, is of little avail in the interior, for there the bundles are not found in cavities in the earth as on the coast but in natural or artificial caverns in the sides of the mountains. So that it becomes necessary to follow up and down the mountain sides until the mouth of one of these caves is located. It frequently is necessary to enter by means of rope ladders, having first provided one's self with artificial lights. In the interior the mountain sides are covered with great masses of soft moss. This is

twisted into a rope and takes the place of burlap and straw used in the work above described. The bundles and their accompanying objects so enveloped in moss are placed in wicker-work hampers on the backs of burros and in charge of a peon can be easily transported to the coast.

The question is often asked, what have the people or the government of Peru to say in regard to all work of an archaeological nature. As a matter of fact the student and the treasure seeker have been actively engaged in despoiling the graves of the ancient Peruvians since the very entry of the Spaniards in 1518. The *Cholos*, or native people, tell you that the ancient inhabitants were Gentiles and have no souls, and although in many cases they realize the fact that they are disturbing the remains of their ancestors, yet they are so accustomed to it that they have absolutely no scruples in assisting you in your work. As for the government, up to within a year it has taken no notice whatever of such work. Quite recently, however, a law has been passed placing a tax of so many reals per day on all work of an archaeological nature.

Let us now notice briefly some of the more important and well known seats of ancient power. Beginning with the coast region we find that it is thickly strewn with ruins of adobe throughout its entire length. To the north Piura, Motupe, Lambayeque, Chiclayo, Guadalupe, Ferreñaje, Pimentel, and Pacasmayo are familiar names in all of the great museums of the world and from their graves have been removed countless objects of interest. The first really stupendous system of ruins, however, is found near Trujillo. These ruins, once the seat of power of the grand Chimu, have been described by almost every writer who has ever written of Peru. We can here only allude to the fact that they form one of the greatest and most complicated system of ruins in all the new world. Unceasing excavations have been carried on for over two hundred years and in the last century over one million dollars worth of gold objects was the result of a single find. Many portions of the ruins have been completely destroyed, but the walls of many temples and palaces are still standing untouched. To the south of Trujillo and distant thirty miles is the far famed Santa Valley, which in ancient times must have been the seat of a dense population and of untold energy, but is today a desert and barren plain. The proof of its ancient occupation is close at hand in the remains of great azequias, enormous reservoirs; elevated roads, and the crumbling walls of houses, temples, and fortresses. Search the sand where you will to a depth of but few inches in the whole valley and you will find bits of cloth, potsherds, grains of corn, and other indications of former habitation. Pottery from Chimbote and neighboring localities in the Santa Valley is to be found in every museum in the world and is universally regarded as the most interesting from all South America.

Further south in close succession are the well known places, Nepeña, Casma, Huarmey, Supe, Huacho, Chancay, and Ancon, each place containing extensive ruins and burying grounds which are all well known and each locality being famed for some special type of pottery or some peculiar style of decoration, either in its fabrics or upon its pottery. The necropolis of Ancon is perhaps the most extensive and best known in all America. From the first entry of Europeans into Peru this burying ground has been a scene of activity and the type of pottery and of the textile fabrics, and the peculiar characteristics of the skull are well known all over the world.

The next important locality south of Ancon and the Rimac valley is that of the Cañete valley, which contains innumerable ruins, many of them in a good state of preservation and still replete with treasures of an archaeological interest. From the Cañete valley southward to Arica over six hundred miles distant are a great many points of interest. The best known of these is Ica, but all of them are practically unknown to archaeological students in the United States, although this region probably offers more that is interesting and entirely new than any other portion of the coast. Not so with Arica, however, for owing to the prominence of its harbor with its ever present multitude of vessels and the nearness of the ruins to the town itself, the burying ground has almost been depopulated, and after Ancon, Trujillo, and Cuzco, no other locality is so well known or has been so well described. Partly beginning with Arica and increasing in extent to the south a new series and a different character of objects are brought to light. Tradition says that the people who inhabited the coast south of Arica and who were centered principally in the towns of Pisagua, Iquique, Tocopilla, and Cobija were of an inferior race to those living to the north and that in very early times they had been made subjects of the Inca empire. Certainly the graves do not yield such artistic and finished products as those of the north, but at any rate they enable us to reconstruct a different, although a much inferior, civilization. Of the localities mentioned it is probable that Pisagua would yield the greatest returns for the least energy expended.

Turning now to the interior, we find an equal wealth and abundance in ruins and material, but owing to the great inaccessibility to get to the majority of the places the construction of the ruins themselves and the contents of their burying grounds are not so well known as those on the coast. Beginning at the north the most prominent places are Huaras, Caras, Cajamaraca, Otuzco, Recuay, Chavin, Huanaco Viejo, Jauja, Huanta, Ayachuco, Cuzco and vicinity, and the region bordering Lake Titicaca. By far the most famous of all these places is Cuzco, for many centuries the capital of the Inca empire. Cuzco itself is not only interesting in its ruins, but on every side within a radius of thirty miles are found great cities, temples, and fortresses. For miles and miles around Cuzco nearly every foot of earth has been upturned by the relic seeker, so that now it is very difficult to make any extended collection in that vicinity without a great expenditure of time and money.

On the western and southern slopes of Lake Titicaca there are innumerable places of interest, differing in many respects from the other three classes of ruins above mentioned. Many of them thoroughly explored and described; others yet remaining are practically untouched. Probably the most satisfactory work yet to be done in the interior is that of the exploration of the great stone *chulpas*, or burial towers which dot the lofty plateau on all sides.

To the would be explorer in Peruvian ruins we would say take plenty of time, more money, and a vast amount of patience. With these three necessary conditions, a shovel, and a steel rod, there is undoubtedly more of profound interest to reward one's labors than in any other country of the New World.

✓  
AN OLD SHAWNEE TOWN IN TENNESSEE.

**I**N Sumner County, Tennessee, at Castalian Springs, are the remains of an old walled Indian town explored by me in May, 1891, and June, 1893. It now consists of five mounds within an area of fifty acres on the level bottom lands of Lick Creek, almost surrounded by low hills. It was, when first discovered by the whites, surrounded by a low circular wall, three



Fig. 1. Gorget from Grave No. 34.

feet high, bearing a series of twenty small conical elevations or tower foundations two feet above the top of the wall or five feet above the surface of the surrounding earth. These tower foundations projected beyond the line of wall both inwardly and outwardly and were from ten to twelve feet in diameter at the base and from two to three feet in diameter on their flat summits. There was a small ditch on the inside of the wall. This wall with its tower



foundations and ditch have entirely disappeared, the land having been in constant cultivation for over eighty years. Two very small mounds within the enclosure are also mentioned in the early descriptions, no trace of which now remain. This low wall must have borne a line of tree trunk palisades surmounted by watch towers for defense, after the manner of many southern tribes described by DeSoto's chroniclers. The shallow inner ditch is a mystery. It certainly must have been a disadvantage to the defenders. The wall was dug into by Mr. Earl in 1820 and found to contain earth intermingled in places with ashes, broken pottery, and charcoal. On the summit of one of the surrounding hills to the north and immediately adjoining the old town is an immense cemetery covering four or five acres and containing hundreds of stone graves. There is a small stone grave cemetery on the summit of an adjoining hill on the southeast and two large ones, covering at one time about one and a half acres each, on the hill side to the south. There are also scattered stone graves all over the adjoining level ground on the east and south immediately outside the walls. The earth on the southern side of the town within the wall is yet black and full of broken pottery, decayed mussel shells, and other household refuse, and was doubtless the main living portion of the town. In a near by cave in the days of the first white settlers was found an immense number of human skulls unaccompanied by other portions of the skeleton: similar lone skulls were found by me in one of the mounds in the town. There remains to this day in a woodland adjoining on the southeast traces of an old path or narrow roadway from two to three feet wide which can be traced at intervals (wherever the ground has not been cultivated or washed) for two or three miles. It lead to the Cumberland River near Canoe Branch and doubtless was the thoroughfare leading to the old Indian town near Lebanon, about fifteen miles away in that direction, or possibly only to large settlements on the river, where extensive cemeteries now are found: showing long residence or considerable settlements of the aborigines. It is within the bounds of truth to say that more Indian graves are known in Sumner county along its various water courses than white graves in the entire county and it has been thickly settled for nearly a century. Every rise and fall in Cumberland River washes its sandy banks and brings to light the skeletons of aborigines in places where no burial was ever suspected. They often buried their dead here in the sand of the river bank to save labor. These were their poorer dead for they are not found in stone coffins nor are beads or any articles found with them.

Mound No. 2 is the largest of the three mounds within the walls. It consists of a mound originally thirty-two feet in height (now only twenty-two), eighty-eight feet in diameter at the base: having on its eastern side a large level platform, two hundred feet in length on its base and eleven feet high, having a level space on top of about sixty by one hundred and twenty-five feet. This platform was doubtless surmounted by some great communal dwelling or some house for religious ceremonies or for the residence of the chief (they were used for all these purposes in various parts of the south, according to De Soto's chroniclers and others). This mound at the western end of the platform was partially explored by Mr. Earl about 1820. He found many layers of ashes alternating with layers of common earth, the body of a child lying on cedar logs with a "sandstone" water-bottle between its feet.



Several other graves were found. The cedar logs were partially decayed but sound at the heart.

Mound No. 3 was explored by me in June, 1893. It is also within the walls of the old town. It is about ninety feet across, measured over the top of the mound, and seven feet high at the center. I commenced on the eastern side, twenty-four feet from the center of the mound, and thoroughly explored a space thirty-five by thirty-four feet, going ten feet beyond the center, finding several beds of ashes some showing action of fire on the earth beneath them, as if a great fire had been kindled there, others showing earth beneath unaltered, as if the ashes had been brought from elsewhere and no fire kindled. I found scattered all through the mound animal bones (not human) and broken pottery, evidently such as the surface soil of an old Indian town would contain. No graves or trace of burial were found.

Mound No. 4 was explored by me in June, 1893. It is on the southwestern side of the town outside of the old walls and about twenty feet from the banks of Lick Creek. It is sixty feet across the top and  $5\frac{1}{2}$  feet high at the center. I commenced on eastern side nineteen feet from center of the mound and thoroughly explored a space thirty by twenty-eight feet, going nine feet beyond center. This mound is remarkable for being largely composed on its northern and eastern sides of common limestone broken into small fragments from one and a half to three inches in diameter. It resembled coarsely broken limestone for use on macadamized roads and in fact was hauled away as fast as dug by me and used for road repairing without any alteration in form. There was more or less ashes scattered through this broken stone, but as far as I was able to determine, the rocks had not been subjected to fire. The mound was within twenty feet of the rocky bed of the creek containing flat thin stones easily broken, but why went they to this labor when soft alluvial earth was all around and so much easier to use? At 18 ft. from the center and 18 inches below surface the broken neck of the aboriginal water-bottle of common Tennessee form was found. Layers of ashes and burned clay (fire beds) were found scattered through the mound in the earthen portion, no fire beds in the rock portion. One fire bed about six by ten feet by six inches deep contained the charred remains of a log about six inches in diameter. At the distance of 16 feet from the center and 14 inches from the present surface of mound, firmly imbedded in the mingled earth and rock, was found an old battered smooth brass button about one inch in diameter, such as were worn about a century ago in this section. It may mean that this button belonged to an Indian and was lost in the building of the mound, making the date of the mound certainly since the white man's advent, or it may be a button from the surface worked down by means of moles or similar agencies. I was careful to note the fact of its being firmly imbedded when found and took the pains to take the names of several reputable gentlemen who were present and saw it found and examined its finding place. No graves or traces of burial were found in this mound.

No. 5 is a mound shaped natural elevation about two hundred feet across top and ten feet high at center. It is on the brink of Lick Creek on the southwestern side of the town, outside the walls and near mound No. 4. It has been explored by others and is a natural elevation shaped up into proper

form by the aborigines. Nothing of interest or relating to man was found on it as far as I can learn.

Mound No. 6 is an elevation on a hill top to the northeast, of such an unusual character that I prefer not to discuss it until I learn more about its history. I explored it. It has a structure similar to No. 4 as far as the small rocks go. No remains were found in it, but it is certainly of human origin. I doubt its being a mound. Old surveys call it a mound.

Few mounds of greater importance than mound No. 1 have ever been opened. It was thoroughly explored by me in May, 1891. It is one of the three mounds within the walls and is one hundred twenty feet across the top and eight feet high at the center. It contained over one hundred human bodies and yielded many specimens of aboriginal workmanship, some of which are of great importance in throwing light on the much disputed question of whether the Cumberland Valley Indians had come in contact with the people of the Southwest and Mexico sufficiently to transplant some of their religious beliefs and emblems. It yielded many traces of aboriginal clothing and burial matting and many perfect crania mainly of the round head type. As space only permits a partial description of this wonderful mound we will take the first graves in the order in which they were opened to give the reader some idea of its richness.

Grave No. 1. Common stone grave type, thin stone slabs set on end, top edges worked fairly straight with rude hammer stones, forming an oblong rectangular box covered with stone slabs placed so as to cover all joints; making a coffin so tight that after untold years little or no dirt has intruded, thus rendering it possible to save traces of clothing that a touch of anything would cause to fall to pieces. This description applies to any stone grave in this mound. No. 1 was the grave of an adult buried extended (no body was found with legs folded up against the breast in this old town). It had long neck type of water bottle at the right of the head, large bone awl or needle near the pelvis, bead bracelets on both wrists. These were small barrel-shaped beads about one-sixth of an inch long, wrought from common mussel shells. Nearly all of thirty different lots of beads in this mound were of this variety, a few being of small sea shells from the Atlantic and the Gulf.

No. 2. Stone grave containing two adults side by side. Engraved shell gorget on the breast of one, a broken shell spoon and badly decayed mussel shell between the feet of the other.

No. 3. Stone grave of adult. At the right of the head about one quart of powdered red hematite war paint. Large conch shell cup, much decayed on the stomach (it required twenty-four hours to saturate it with varnish so as to enable us to remove it). Beads around the knee and ankle.

No. 4. Stone grave of infant. No ornaments or implements.

No. 5. Stone grave containing bodies of three adults. Two buried with their heads at opposite ends of coffin, the limbs of each over and by the side of the other. The remains of the third were in a heap in one corner as if it had been the original occupant whose bones had been rudely raked aside to make room for the late interments, or, which is more probable, it had been brought from elsewhere after the decay or removal of the flesh and lovingly interred in the coffin of friends. We know from accounts left by some of the early explorers that some northern tribes were accustomed to gather their

dead every ten or fifteen years, those lately deceased and the bones of those long dead, and with feasts and wailings and ceremonies bury them in one great communal grave.

No. 6 was another example of the same custom of bringing the bones from elsewhere after the decay or removal of the flesh. These bones of an adult had been placed in a compact bundle in the mound and covered with earth. No coffin or ornaments.

No. 7 was a human head accompanied by no other portions of the body. Several more burials of lone heads were found in the same mound. This, coupled with the lone heads in the cave already referred to, points out a curious custom. No coffin or ornaments with this head.

No. 8. Another lone head. This time in a neat stone box just large enough to contain it.

No. 9. Stonegrave of adult with engraved shell gorget on breast, extra large and heavy head, wristlets on both arms. Decayed mussel shell near the body.

No. 10. Body of adult with cedar logs at the side. No other protection. Gorget on the breast. War paint near head.

No. 11. Stone box 14x26 inches, containing bones of adult and child about one year old, in a compact bundle.

No. 12. Stone box 13½x13½ inches, containing lone head.

No. 13. Stone grave of adult and young child not over one or two years of age. Child's bones laid as if carelessly or rudely thrown in (Was it buried alive?) and body of the adult, probably its mother, placed on top of it. It was diagonally under the neck and shoulders of the adult. Trace of bark matting. Trace of decayed wooden object. Burial pot at the right of the head of the adult. A small stone box built on the end of this coffin contained bones of an adult in bundle.

We now begin to pass rapidly, not that the unmentioned ones are of no importance but for want of space.

No. 17. Empty stone box 24x14 inches. Not the slightest trace of a body. Partially filled with loose dark earth, probably from the decay of bones. Had bed of hard dirt and ashes at bottom, but did not seem to have been subjected to action of fire.

No. 19. Adult buried full length, dirt thrown directly on the body. No coffin or ornaments.

No. 21. Empty stone box 12x18 inches. Partially filled with loose dark earth. This was near center of the mound. This box was imbedded in a lay-

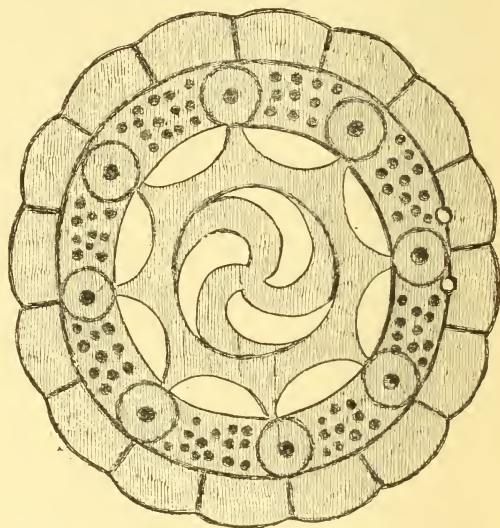


Fig. 2. Gorget from Grave No. 34.

er of ashes with burnt earth beneath them (the remains of a fire.). The bed of ashes was five feet in diameter and on the original surface of the soil at the bottom of the mound. The box showed no sign of action of fire.



**Fig. 3. Engraved Stone 9x12 inches, from Castalian Springs, Tennessee.**

No. 32. Stone grave of person twelve or fifteen years of age. Beautiful pearl and bead necklace upon the breast.

No. 34 was body of adult buried with cedar logs at the side and on top and contained the finest specimens of aboriginal art ever unearthed in Tennessee and amongst the finest ever found in this country. The body had bead wristlets and anklets, engraved gorget on breast, four fine, well preserved gorgets and about a pint of beads and pearls between the feet. Two of these latter gorgets are above figured, Fig. 1 and Fig. 2.

Fig. 2 is a rather common Cumberland Valley form. So were the other two found with them. The gorget around neck was similar to No. 2. But No. 1 is very rare. Some copper plates found in the great Etowah, Ga., mound have engravings showing a kindred idea and an engraved gorget from the same mound has almost the same work on it (See Figs. 42 to 47, Report of Bureau of Ethnology for 1883-4). A similar gorget was found near New Madrid, Mo., (See Plate XVII, p. 347, Thruston's "Antiquities of Tennessee.") An engraved stone about 9x12 inches was found on the surface of the soil in 1892 by Mr. Angel, who presented it to me. It was found within the walled



enclosure of this old town and has almost the same idea as that shown by the Etowah copper plates. Fig. 3, engraved stone 9x12 in. from Castalian Springs, Tenn.

These plates and gorgets have a certain something about them, especially about the complex head dresses, that suggests a connection with Mexico and many theories as to their origin have been advanced. The engraved stone is of common Tennessee Trenton Period limestone, probably picked and wrought within sight of the spot where found. A careful perusal of the text accompanying the cuts of the Etowah plates will show that the person had ornaments buried with him similar to a portion of the complex head dress and he may have dressed similar to the figure represented on his copper plates.

I found ear rings of exactly the same shape as those on my Fig. 1, in this same mound in an adjoining grave. The manner of wearing the gorgets on breast and the style of gorget is the common way on all the bodies found in this and many other Shawnee mounds. The same is true of the bead necklaces, wristlets, and anklets. These facts and many others prove these copper plates and engraved gorgets to be of home production, with a faint possibility of a remote Mexican origin for the custom, the bottom of it all. The chances are against the Mexican origin in my opinion.

No. 39. Wood grave of adult grasping finely wrought ceremonial flint, 12 inches in length, one and one-half inch wide and one-fourth inch thick, in right hand. Water-bottle at the feet.

No. 56. Stone grave with two bodies. One had an engraved cannel coal gorget on the breast bearing an equal arm cross, one of those kind of crosses upon which people formerly built such vast theories of Indian migrations.

No. 60. Stone grave of child about four years old, with the rare gorget shown in Fig. 4 (the square one with inner circle and bird head) on the breast.

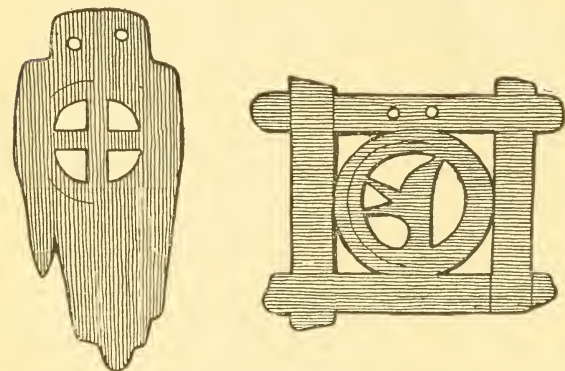


Fig. 4. Gorgets from Graves 60 and 61.

carefully preserved by us by saturating with varnish.

No. 70. Wooden grave of child containing two conch shell cups, holding one pint of beautiful small sea shell beads, two perfect discoidal stones, one flint chisel, and at each ear a circular ear ring of mica with center of wood plated with copper like those on Fig. 1. Finely wrought engraved shell gorget similar to Fig. 2, studded with thirteen pearls around the disk upon the

No. 61. Stone grave of a child with the unique bird wing gorget with inner equal arm cross (shown in Fig. 4) on the breast.

No. 63. Stone grave of adult containing traces of bark clothing similar in texture to coarse coffee or corn bagging. Also a curious rattle or medicine bag,



breast. It must have been wonderfully pretty before the shell and pearls lost their luster.

No. 76. Stone grave of adult with a grim reminder of savage ferocity in the shape of a human frontal bone perforated and suspended around the neck.

Adjoining 90 was a triangular stone box containing a coiled wooden serpent, copper plated. Two bone awls or needles in the same box.

No. 91. Stone grave of adult and child. The adult held two beautiful terra cotta images in left hand. They were male and female. Gorget on the breast. Two pots at right of head, one within the other.

From many proofs in my possession for which I have not space here, I feel reasonably certain that Mound No. 1 is not over 300 years old, and that the Shawnees, who built the Etowah, Ga., mounds built this town. That after many vicissitudes, rarely excelled even in savage annals, this tribe was harassed almost to extinction by the Iroquois on the north and the Cherokees and Chickasaws on the south and finally the last small remnant barely escaped with their lives from the Cumberland Valley in 1714. At this old town one of their last stands was made. It is a curious coincidence that after this catastrophe the country became uninhabited as the "Dark and Bloody Ground" for sixty-five years and the first white man settled within a stone's throw of the old town wall.

W. E. MYER.

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## THE RELIGIONS OF THE ANCIENT EGYPTIANS.

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[BY DR. GRANT BEY.]



HE primitive religion of the Egyptians was a pure monotheism, which in later times, through personifying the attributes of the Deity, became out and out polytheism. There is no difficulty in tracing back this polytheism to its original monotheism.

At first the Egyptians had no form for their Deity. He was without temple and ministrants, he was unnamed and *self-producing* and *self-existent*; he was the source of life, light and creation generally; he is represented as being in a measure passive, but working behind and through the powers of nature; he did not himself create, but created all things through Ra, the sun god; he was the divine ruler over Egypt and over the whole world, and was ultimately named Ptah, which means the molder or carver; he was succeeded by Ra, the sun god, a secondary deity to Ptah, and, in fact, Ra simply represented the creative function of Ptah. The reigns of these two deities would correspond to the first two dynasties of the mythical period of Ancient Egyptian History according to Manetho.

The third dynasty of this period (mythical) was a dynasty of demigods. Manetho does not give the reason for this retrogression, but it is explained in a legend that represents Ra as an offended deity who withdrew himself from man, the offender, and sent Sekhet (drought) and Isis (flood) to destroy him. The people of Elephantine, in the region of the first Cataract, were saved be-

cause they brought a sacrifice of the juices of fruits mixed with human blood which Ra drank and was satisfied; but he could no longer hold intimate or even personal intercourse with man, showing that something had tainted him so that the purely divine being could no longer dwell with him. Man being naturally a religious being could not endure the withdrawal of his god, and God had pity on him and partook of the nature of man, while he remained God in order to reign over man again and restore him to the deity's favor. This was taught to the people by the priests as follows:

The sky that bent down and embraced the earth was deified and called Nut (a goddess), and the earth was deified and called Sed (a god). This formed a conjugal union between the two, the result of which was a large family of brothers and sisters, who partook partly of the celestial and partly of the terrestrial nature. The head of this demigod family was Osiris, who is represented as reigning at Abydos, in Upper Egypt, and as going on journeys up and down the land, and even into other lands, teaching the people agriculture and the cultivation of the vine. He married his sister Isis, and when absent on his beneficent missions Isis sat on the throne and ruled until his return. This arrangement, however, did not please Set, the brother of Osiris, who perhaps thought he was the proper substitute for his brother, so he conspired with seventy others to kill Osiris when he came back. This conspiracy was carried out successfully. Osiris was killed, and Set assumed the title of ruler, and sat on the throne of Osiris, and reigned over Egypt four hundred years. Isis, hearing of the murder of her husband, searched for his body, and when she found it, wept over it, and while thus occupied she conceived, and in due time brought forth a son, Horus, who was destined to take vengeance on his uncle (now the evil principle) for having murdered his father. Horus fought against Set, and dethroned him after he had reigned four hundred years. As he was a demigod he could not annihilate him; so Seb, the grandfather of Horus, came and arbitrated between them, and decided that both should have place and power; and he assigned Upper Egypt to Horus and Lower Egypt to Set. This story was the way in which the priests taught the people as to the origin and continuance of evil.

The fourth dynasty was a dynasty of prehistoric kings, who were simply the representatives of Horus on earth; and all through the historic period the Pharaohs were deified and were looked upon as the personification of Horus or "the sun at sunrise." Hence the origin of the divine right of kings, and the maxim "The king can do no wrong."

In the developement of the ancient Egyptian religion we have Osiris (father) and Horus (son) making one God. We also find the Trinity in unity, forms of metaphysical thought beyond the powers of man to comprehend, and that could not have originated with man. They are revelations from God, and have therefore to be accepted by faith as they are taught in the inspired writings, or original traditions that may have never been committed to writing, but that can be traced in the religious beliefs of the most degraded races of mankind.


The ancient Egyptian's hope for time and for eternity was his belief in the story that Osiris had died to atone for his sin and his acting up to the code of morals. The history of the ancient Egyptian religion is a striking example of a pure and spiritual worship, untrammelled by symbols or material forms

for many ages which at last degenerated into a despicable idolatry through the priests endeavoring to teach the ignorant people spiritual truths by clothing them with material forms, a most dangerous thing to do, even in the purest religion.—The Independent, Oct. 26, 1893.

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## ANTHROPOLOGY AT THE WORLD'S COLUMBIAN EXPOSITION.

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HE building devoted to the exhibits of Department M (Archæology and Ethnology) was in the extreme south end of the Exposition grounds. This department was the last to be put in order and it was well toward the latter part of July before every exhibit was in its place. The delays may be attributed to several causes. The department was not as large as the other departments of the Fair and the Board of Directors were compelled to use every means in their power to finish the larger and more important buildings and to see that the displays contained in them were in order as soon as possible after May 1st. All through May carpenters and mechanics were hard at work completing the Anthropological Building and it was not until after the first day of June that the structure was turned over to the chief, Professor Frederick W. Putnam, of the Peabody Museum. Once behind, the department moved slowly, and as is the case of a train which is late, it lost the "right of way." The exhibits being largely of a scientific nature necessitated great care in their arrangement and possibly the department did not realize the amount of work to be done. Be that as it may, everything in the structure was in readiness July 1st for those who wished to study the arts, life, and the mortuary customs of primitive peoples had an opportunity such as is seldom presented to the student west of the Allegheny Mountains.

When Professor Putnam was appointed chief executive of the department, he called together a number of assistants from various institutions, men who were particularly skilled in various lines of research. Some of these he sent into the field of South and Central America, to Alaska, to the Pacific Coast, along the Atlantic sea-board, in the Ohio Valley, etc. Others established a great laboratory of Physical Anthropology. He asked for the co-operation of various foreign governments, and as a result there were exhibits from Australia, the South American and Central American governments, Canada, and other countries illustrating the life of the aborigines from nearly every quarter of the globe.

Officially the department was divided into Ethnology, pre-historic Archæology, and Physical Anthropology. There were several isolated exhibits in the building which hardly came under any of these heads, although for the present they were classified under the general term of Anthropology. There were

exhibits treating of charities and corrections, hygiene and sanitary plumbing, gymnastic apparatus, and the treatment of criminals. The latter is a study for the scientist who deals with modern, as well as prehistoric anthropology, and it shall not be referred to this paper.

The ground floor was divided almost exclusively between Ethnology and Archaeology. The galleries contained natural history exhibits and the laboratory of Physical Anthropology. There were approximately one hundred and fifty exhibits of a scientific character in the department, and these contained a total of 3,000,000 objects and constituted the largest and best classified museum in the United States next to the Smithsonian Institution and the Peabody Museum. Remarkable as this may seem all of these exhibits have been prepared and mounted so that the intelligent observer, as well as the man of scientific attainments, may comprehend them within the short space of two years. All the field work projected by the Department two years ago has been faithfully carried out, the photographs, maps and drawings officially turned over to the Chief, and the discoveries classified and exhibited. In spite of the short time allotted for the work, and the exceedingly great territory covered, no one has heard any of the visiting scientists find fault or criticise any of the official displays.

It has only been within the last few years that the universities in the United States have adopted Anthropology as a part of the college curriculum. The University of Chicago, Johns Hopkins, Harvard, Yale, have given lectures during the past year, and the Leland Stanford and Dartmouth Universities have funds for the building of museums to be devoted to this new science.

Professor Putnam desired to make an exhibit which should convince visiting foreign scientists that America understood the importance of Anthropology and that the habits, manners and customs of our prehistoric races, the folk-lore and mythology of existing tribes, the physical peculiarities of ourselves, and the treatment of criminals was being looked into and investigated. There is much difference between this and other exhibitions. At the Centennial the State governments and the exhibits of the different universities were almost entirely confined to a study of the various stone implements and other relics used by aboriginal peoples. Since that time many smaller expositions have exhibited collections of relics which had little or no scientific value. The Smithsonian Institution and a number of other museums and colleges have stimulated research in this country and it is largely due to them that the subject is better understood at the present day.

In the north end of the building were several exhibits from the Pacific Coast, Alaska, Canada and the northwest. These, in the main, showed the implements used in warfare, for domestic purposes, in the dance and at the funeral. One of the largest collections of garments worn by the plain and mountain tribes was the exhibit by Mr. E. E. Ayer. Some years ago this gentleman conceived the idea of preserving representative costumes of every tribe, before the picturesque dress had been modified by contact with the whites to such an extent that it should lose its aboriginal characteristics. For many years he traveled, traded, and purchased among the tribes west of the Mississippi, and as a result his costumes represented the highest degree of tanning and ornamentation attained by the Indians. Some of the robes,



blankets, and coats represented one or two winters of continuous work. Many of them were covered with fifteen or twenty pounds of beads, and one in particular had nearly one thousand elk teeth strung about the garment from the neck to the waist. From each elk were taken but two teeth (eye teeth). This collection was not a mere mass of trinkets. It had an ethnological value because every garment was properly recorded, and because the cheap "store clothes" and colored calicoes are fast taking the place of the picturesque buckskin, feather, porcupine quill, and bead covered garments.

Mr. Seever, representing the Missouri Historical Society, had one of the best collections in the entire building. While he had not exhibited maps or photographs of the explorations of the society, his series of implements and utensils, numbered upward of twenty thousand, and in point of space covered was excelled only by Peru, Australia, and Mr. Ayer's Ethnologic collection. The Messrs. Wyman presented very interesting collection of Wisconsin copper implements, from the vicinity of the pre-Columbian copper mines. Next to their display, was that of Dr. Phillips, who illustrated flint implement manufacture from the rough nodule to the finished implement. The primitive occupation of the Southern States was shown by Mr. Riggs in his Mississippi and Arkansas pottery collection. His exhibit was referred to in a previous number of the *Archæologist*.

The Pacific Coast, south of the Columbia River, was represented by Mr. Rust in a complete series filling ten or twelve large cases.

During the past two years, there has been much discussion concerning the existence of glacial man in this country. Professor G. Frederick Wright, of Oberlin College, represented the glaciated area of Ohio by mounting boulders and sandstone slabs grooved and cut by the action of the ice, pebbles, sand and till from the various morains and deposits. Along with these he mounted a number of photographs showing the location of at least two paleolithic implements: one from New Comerstown, O., and the other from near Madisonville. The discoveries have been referred to in the magazines and one should not go into details here except to say that many persons are of the opinion that the implements represent quarry rejects, and not tools used by a primitive being of the same age as the glaciers.

Next to Professor Wright's exhibit were a number of flat cases filled with rough finished and unfinished implements from the Delaware Valley, collected by Mr. Ernest Volk, one of the Department assistants. Mr. Volk and Dr. C. C. Abbott, who was formerly associated with Professor Putnam, claim to have proved the existence of glacial man in the Delaware Valley. Mr. Volk's exhibit showed the difference between a true paleolithic implement and more delicate specimens of the same material from modern village sites and quarries. Many of these specimens he found in the gravels of the Delaware River. They were more or less worn by contact with other pebbles and stones. This, he claims, gives them antiquity. On the other hand, Mr. W. H. Holmes, of the Bureau of Ethnology, who had a display in the Government Building, showed implements like those of Mr. Volk's. He found his in quarries and upon village sites, and claims for them the name of "rejects," or stones which, when chipped to a certain form, were found unfit for the fashioning of implements and were cast aside by the ancient workmen. It is thought by many that the implements found in the Delaware Valley have been washed



from the village sites into the stream, and that they are not true paleoliths, but unfinished or imperfect specimens. There are points on both sides of this discussion, but it is hardly the proper place for one to enter into a debate in this magazine concerning the existence or non-existence of such a man. As Profeseor Wright, Mr. Holmes and Mr. Volk have taken up a new and interesting phase of prehistoric anthropology, their specimens should be carefully studied.

Returning to the west side, beyond Mr. Ayer, one found the exhibits of Australia and New South Wales.

The government of New South Wales had charge of the exhibit, although the collection was largely the property of several gentlemen. It had a considerable value, because there were placed upon the walls surrounding the cases, several hundred Bromide enlargements of photographs. These views illustrated native dances, mortuary customs, and the physical traits of men, women and children of Australia, Samoa, the Navigator, Solomon, and New Islands. The taking of such a series of photographs, necessitated traveling hundreds of miles overland through the bush. Dr. Brown, F. R. G. S. and Mr. Lindt, of Sydney, made the negatives.

Several of these photographs were deserving of especial mention. One showed a group of New Guinea savages in front of a hut, while upon the roof of the structure was a long row of human skulls. Another illustration represented the Duk-duk or principle secret society of the South Seas. One interesting feature of this society was the lodfie house, called the Taieyu. It was strictly tabooed by the uninitiated and by women, and any person going near it endangered his life, or was at least severely beaten and heavily fined. The women and young men were supposed to believe that the Duk-duk was a spirit or devil from the bush, though they must surely know the mask but covered the figure of a man. Many of the photographs of the Samoans presented extremely good features. Nearly all of the figures held flowers in their hands,—this is a charming characteristic and seldom appears among savages. Another photograph showed two large stones, which stood some fourteen feet above the ground. On top of them was a stone sixteen feet in length and five feet thick. Unlike the Dolmens of England or France, the covering was mortised into the two upright stones. The natives could give no explanation as to the origin of this singular monument, and regarded it as being erected by some Tongan Hercules.

The Fijian natives were given considerable space in the section. A number of costumes of elaborate tappa cloth, painted and decorated, were exhibited. The garments were tastefully decorated, the colors being laid on with a fist-shaped piece of wood resembling a paper-cutter. The musical instruments, shell and teeth necklaces were similar to those used by all savages.

The pipes somewhat resembled the long stemmed catlinite pipes used by our modern Indians. A large roll of tobacco was placed in the bowl of an unusually large pipe and the stem (something over a yard in length) was passed from one to another about the family circle, the pipe meanwhile turning upon its base in the center of the group. A knife of European make accompanied the Fiji exhibit. It was about fifty years old, and during a native revolt about 1850, it was used by a sub-chief in the killing of three priests.

From the Solomon Islands were a number of wooden figures, representing

human and animal effigies. These were inlaid with mother-of-pearl, the wood itself being highly polished, and resembling in grain and color, mahogany. A large boat-shaped bowl, six or seven feet in length, and three feet deep, was the most prominent object among the inlaid specimens. It was highly prized by the tribe and formed the occasion of tribal dances, being filled with native wine. As the dancers circled about it each one drank to the health of the principal god, and to the chief of the nation.

The collection from Australia proper contained all the known types of boomerangs, waddies, throwing sticks and other weapons of the Black. The gentleman in charge of the exhibit, Mr. H. W. Bowman, had been among the Blacks for a number of years, and his stories of adventure were extremely interesting. He informed us that the natives become so skilled in the use of the boomerang that they have been known to throw it with such force that it would burn the clothes of the person struck at the point of contact. One can scarcely conceive that so rude a looking weapon could attain such a speed.

The boomerangs were usually eighteen inches long, and one and three-quarters inches wide, pointed at both ends and about an eighth of an inch thick. The flights in air made by these instruments are familiar to the readers of this magazine. All of the older boomerangs were elaborately carved. The incisions represented incidents from the life of the owner. The weapon remained in the possession of the maker all his life and at his death was carefully preserved by the oldest son. Above the display of boomerangs was a series of eight pictures, showing an aboriginal ceremony called the Yoo-long-era-diang. This ceremony introduced a young man into the privileges enjoyed by the men of the tribe. About fourteen days were consumed in the initiation, sentinels meanwhile being placed around the ceremonial ground to keep away the uninitiated, especially women. In case of an intrusion on their part, the penalty was death. Not every man of the tribe belonged to this order. A young man selected by the chiefs to be admitted to the order, must exhibit certain qualities and virtues admired by the aborigines. The most greivous sin in the eyes of the Australian Blacks is selfishness. Should the rising youth show that particular wickedness he can never attain to the position occupied by his superiors. As the mark that he has been elected to all the degrees, and in order that those living at a distance may recognize his standing, an upper front tooth is broken off. Those persons who are not honored by adoption into this order, become the slaves of the tribe. There was a photograph of an intelligent looking australian, called Mikey. He was never worsted in a personal encounter with neighboring tribes. He was tattooed, his arms and chest having been lacerated, and all these marks illustrated his valor in war, and his high standing among his people.

The government of Australia has appointed a competent Board and the people themselves have established a society to look after the welfare of these aborigines. Industrial institutions and schools have been established, similar to those now upon the Indian reservations of our own country. But the civilizing of the Black is an extremely difficult matter, and so far the efforts of many competent men have been spent in vain.

Dr. Renwick, Executive Commissioner, from Sydney, was in control of all the scientific exhibitions from Australia.

In the main aisle of the Anthropological Building were the models of the

dwellings and totem poles of the Indians from Queen Charlotte's Island, British Columbia. Professor Putnam had the exhibit placed immediately in front of a high partition, and upon the face of this was painted the mountains and forests immediately in the rear of the town. A platform extended out about six feet from the painting and the houses and poles were erected upon this structure so that in the distance the resemblance to the actual village was quite striking. Mr. J. Deans, a Scotchman, who has lived among the Alaskan and Island Indians of the North-West for the past thirty years, was in charge of the exhibit. He also looked after the welfare of the real Alaskan Village and the Indians themselves upon the shores of the South Pond, immediately in front of the building. He spoke several Alaskan dialects.

The natives called their town Illth-Ch-geetla, and the Whites called it Skilleegatstown, because the chief always takes the name of Skilleegate. The villagers were strictly an Island people, none of them living on the main-land. The totem poles and character of the houses have been illustrated and described by Lieutenant Schwatka and Dr. Boas. The house varied from thirty to sixty feet in width, and from twenty-five to one hundred feet in length. Inside of them were small rooms or miniature houses, like the large structures, in which several persons slept. The totem poles recorded instances from the life of the head of the family and his wife. They also represented the mythology and the folk-lore of the people.

Mr. George A. Dorsey spent nearly two years in Peru for the Department.

He constructed a section of the Peruvian Burying Ground from Ancon. This attracted more attention than any exhibit in the building, because it contained thirty or forty mummies of the Ancient Peruvians, laid out upon the sand, just as they existed at far-off Ancon. These were not mummies in the proper sense of the word, but more properly desiccated bodies. The dry climate of the Peruvian coast has more to do with their preservation than the arts of the people themselves. The bodies are usually doubled up, the knees drawn to the chin and many yards of good cotton cloth wound tightly around the remains. Over the cotton cloth are a number of thicknesses of heavy, coarse cloth or matting, which is tied with cotton or hemp rope. The graves are generally found at a depth of six feet. The cemetery extends for nine miles along the coast and probably is the largest burying ground, either prehistoric or modern, in the world. Considerable gold has been found with the remains, and therefore the natives have been digging in the cemetery for upwards of two hundred years.

Mr. Dorsey had beautiful feather robes, some of which contained the plumage of more than ten thousand birds, and represented several years labor in the manufacture of a single garment. The pottery was of superior finish and decoration, and in form resembled much that we use today, and the greater part of that in use in the Etruscan and early Roman periods in Europe. The bronze, copper, gold and silver idols, utensils and ornaments speak plainly for the culture attained by the people of the Inca Empire.

From the Colorado River country, in the southwestern portion of the United States, is a large collection of mummies, pottery, sandals, garments, etc., once belonging to the tribes inhabiting the Cliff Houses, and the underground caverns so numerous in the cañon. The study of the Cliff Dwellers and their remains, is one of the most interesting departures in American Archaeology, and

Mr. H. J. Smith, who was just outside of the building, and Mr. McLoyd within the building, have both given excellent material for study. Mr. Smith had built an exact fac-simile of the cañon walls and the Cliff houses. The dry climate of the cañon country has preserved for the archaeologist textile fabrics and other perishable objects, which if left in the mounds or burial places of the Mississippi Valley would long ago have decayed.

Dr. Emil Hassler, a noted South American scientist, exhibited a collection from Paraguay and around the head-waters of the La Plata. Some of it was from even so far north as the southern provinces of Brazil, especially the bright feather garments, and a portion of it from the great plains of the Argentine, a region commonly known as the Grand Chaco, and included complete costumes of the natives, the Arancauians.

The exhibit included hundreds of completed costumes, showing the mode of dress among the savages as they exist today in the eastern half of South America. Considerable material was shown from the ancient graves of this region, which was very interesting, inasmuch as very little work was ever done there.

The costume in general of the South American Indian consists of the following garments: A head-dress which usually consists of brilliantly colored feathers laid on a hammered bark foundation; a potticoat or shirt of closely woven vegetable fiber, generally dark in color, and constructed on the same form as those found in the ancient graves of Peru and Bolivia. Frequently there is a back ornament, which is made of bird bones, sometimes human hair, and decorated with beetles' wings, etc. Besides these three garments there are usually numerous ornaments for the ears, neck, arms, legs and ankles. These necklaces, armlets, anklets, etc., are very commonly worn, and Dr. Hassler showed a wonderful variety of them. Among the objects mentioned for making these necklaces may be mentioned long wing bones of various birds, bright colored seeds, huge rattles from the rattlesnake, shells, teeth of the monkeys, the jaguar, puma, and other animals. The principal weapons used in warfare are the bow and arrow, and the war club.

It is easy to distinguish the costumes of the Southern Indians from those of the lower provinces of Brazil, for the Plains of the Grand Chaco are literally alive with the great American Ostrich, which furnishes the Indians with dress and food.

The bows are generally over six feet in length, and are invariably made from a species of palm which is used throughout South America for this purpose, and is called Chonta. "Chonta" is the Chioclia Indian name for bow. The arrows are of long, straight, light reeds, finely tipped with feathers, generally notched, and with a long, sharp point, of the above mentioned Chonta. They also use an arrow, the point of which consists of a knob or ball, about an inch in diameter. This is used for wounding birds so that they may capture and tame them. No Indian hunt is ever without its numerous pets, which include birds of the most brilliant plumage.

The war club consists of a heavy shaft of the Chonta palm, which is very hard. It is used as a spear when it is over eight feet in length, or it may be shorter, and have fastened to one end a stone axe.

One of the most essential articles to the Indian's costume is his pouch or sack, in which he carries his game, food, charms, etc. These are much like the modern game-bag, and looks like a fisherman's net. They are made out of



the different kinds of fiber or grass which grows so abundantly in this country.

The natives use a small whistle made from a reed to call each other when traveling or hunting through the dense forests. Besides this they have a great many more elaborate musical instruments, some of which are very much like a Pandean pipe.

Hammocks were made from the grass, the great pampa of the La Plata, having always been famous for its wonderful hammocks made of these grasses. The collection included a great many of these, some of them very finely woven and very costly. From these grasses, they also make mats, which they use in their houses, and rope, twine, etc. of great strength.

The potter's art never reached a very high stage of perfection on the La Plata. The collection included, however, some of the best pieces to be found. It also contained several interesting pieces which have never been burned, and others unfinished in order to show the method of manufacture. These people also used the calabash as a household utensil to a very great extent. They were often very beautifully decorated, both by being painted and incised.

Mexico, Brazil and Nicaragua had archaeological displays in the center of the building, on the ground floor. They scarcely differed in character from the other Central and South American collections, and no reference will be made to them here.

One of the village-sites, of Mound-building tribes in Southern Ohio, was explored by the President of The Archæologist. The results of the work were shown near the center of the building. The area examined extended over some one hundred and thirty acres, in the Scioto Valley (Ross county, farm of Mr. M. C. Hopewell), and was thought to be a promising field for research. Surrounded by an embankment, varying from four to seven feet in height, were twenty conical and two oblong earthen mounds. All about the structures on the plain was village refuse, such as pottery fragments, broken implements, burnt stone, bones, charcoal, ashes, etc. After the survey had ascertained all the facts pertaining to the settlement, the burial mounds were opened. All of the fall and winter of 1891-92 was spent in this work. The discoveries were extensive,—beyond the fondest expectations. In the largest mound of the group,—called the "Effigy" because of its resemblance to the human trunk,—were several deposits of sheet copper, two clay sacrificial altars and nearly one hundred skeletons.

The altars were basin-shaped, and stood a foot above the floor of the mound. Approximately, they were seven by five feet, and the cavity eight or ten inches deep, and five by three feet in size. In this cavity, the builders of the mound had built a fire, and while that fire burned, heaped upon it their choicest possessions. In removing the contents, there were found eight substances foreign to Ohio,—obsidian, mica, cannel coal, sharks' teeth, Bad Lands fossils, Atlantic Ocean shells, galena and copper. The presence of these in great quantities indicated aboriginal trade and exchange in pre-Columbian times. The obsidian implements were especially numerous and upon analysis were found to be of the Yellowstone variety, and that they had been brought twenty-eight hundred miles. In the others were several effigies carved out of the stone and bone. The execution of one of these seems extremely difficult when one considers that the artisan fashioned it with stone tools. It



was a beautiful pipe, and represents a duck upon the back of a fish, and has been described in the November *Archæologist*.

Among the sheet copper were two Swastika crosses. This ancient symbol of Sun and Fire worship is found scattered all over the world among primitive peoples, but it was not known to have existed in the Ohio Valley. A skeleton covered with plates of copper, pearl beads, etc., and having at its head a remarkable representation of antlers (in copper) was found near the center of the effigy.

But to return to the other exhibits in the building.

Professor Desiré Charnay was one of the leading authorities on the ruins of Yucatan. His first trip was to the land of the Mayas, fifty years ago, and the results of his work were published in an elaborate volume of photographs of the ruined cities of Central America. This volume is very rare now and commands a high price. Since that expedition he has been to Central America five times, remaining through one or two seasons on each trip.

His collection consisted of a series of casts taken from the original slabs which are now in the Mexican Museum. Nearly all of them were covered with hieroglyphics. One, taken from the interior of a room showed a feathered serpent with inscriptions. These were taken from Tikal, Guatemala. Nothing like them has ever since been discovered. Several pieces of sculptured lintels are shown, made of sapote wood, which is very durable and looks like mahogany. Two slabs were shown from the ancient city of Menche. Charnay says in that city there are at least one hundred slabs beautifully carved, which could be easily secured by some of the scientific institutions.

The exhibit also included several magnificent slabs from the Palace of Inscriptions, at Palenque. The celebrated tablet of the cross, with its strange carvings of the serpent, also the foliated cross which was discovered by maler a few years ago, with several reproductions of the stucco carvings here reproduced.

Probably the most interesting to the popular observer was the interior of the chamber of the "tennis-court" of Chichen Itza, Yucatan. What is left of the sculptured wall was reproduced in plaster and represents five lines of human figures in various postures and with various objects in their hands, most of them with bows and arrows. Portions of it has been colored by Charnay, the colors being reproduced as they were seen in the old Mapá and Aztec manuscripts.

Some bas-reliefs were shown from the Temple of the Sun at Palenque. They are in three parts, one is in the National Museum at Washington, one in the Mexican Museum, and the other is still at Palenque. The cast was taken from the one in Washington. It is a figure of Quezacochtli, the great god of the Aztecs.

The celebrated statue of Tlaloc, the god of the rain was shown. This statue was discovered by Dr. LePlongeon, at Chichen Itza, Yucatan. It was called by him Chaac Mol. The original is now to be seen in the Mexican Museum. Two smaller statues of great interest were also there, which were molded by Mr. Charnay, in Mexico. Near it was a shield-shaped inscription, from the house of the Governor at Uxmal, Yucatan, which is probably the greatest and best preserved ruin in Central America today, being three hundred feet long and containing thirty-two rooms. It is built on three terraces.

A copy of the so-called sacrificial stones was given, which, however, is a misnomer, as has been shown by recent researches in Mexican archaeology. It is a stone representing an historical event or series of historical events, which have taken place under some kin and has nothing whatever to do with human sacrifice.

The collection of Charnay, the Berlin Museum, and the Peabody Museum, having been all brought together here, make the finest collection of Central American Antiquities ever on exhibition in one museum, embracing as they do the many inscriptions and all the curious symbols and figures for which the ancient cities of Central America are noted. Hung about the walls of the Central American section were series of fine photographs of the ruined structures made by the Peabody and the Berlin Museums. These photographs showed the ruined cities of Labna, Uxmal, Chichen Itza, Kabah, and many smaller cities in Yucatan and the ruins of Copan, Honduras. Among the many interesting things in the collection were the figures made by Mr. Alfred P. Maudslay, from the ruins at Palenque, Chaipas, Mexico; Quirigua, Guatamala; Copan, Honduras; and Chichen Itza, Yucatan. Also many beautiful slabs and statues from the ruins of Copan, which were made under the offices of the Peabody Museum, Harvard College, Cambridge, Mass., and under the immediate direction of Mr. M. H. Saville, and the late John G. Owens.

We have endeavored to mention in the foregoing pages the important features of Professor Putnam's department. Necessarily, in a brief paper, many interesting points must be condensed. As a whole, the department, although it has been but two years in formation, ranked third among the museums of the United States.

The great work undertaken by the department gentlemen was not in vain.

Of the twenty thousand visitors each day, many who came as mere "relic collectors" left the building with broader views, and with a better understanding of Anthropology in all its divisions. A large number of those thus interested will form scientific societies in the communities in which they reside,—other will join the established Anthropological organizations, and thus the new science will be aided and its influence spread; and John Smithson who, when he, by endowing the Smithsonian Institution, builded better than he knew, said "Knowledge will be diffused among men."

WARREN K. MOOREHEAD.



# The ARCHAEOLOGIST

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## EDITORIAL.

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The management of The Archaeologist desires to express its gratitude and appreciation to Mr. A. F. Berlin for his services during the past year. It is no small task to assume the editorship of a publication of this character during its first year,—in truth the beginning year is the most difficult of all. Mr. Berlin has maintained a high standard and the gradual improvement of the journal and its increased circulation are largely due to his selection of the class of material to be published. We acknowledge our indebtedness to him for his efforts on behalf of the journal.

In one or two months we will have a foreign correspondent who will furnish us with contributions regarding the progress of archaeology abroad.

There is not much to record in the progress of archaeology. Several new books have appeared, discoveries have been made in Peru by an expedition recently sent from San Francisco, Cal. There are no details as to the nature of the finds.

We request our readers to send in communications upon discoveries of note. Any facts concerning the archaeology of a given locality are desired for the correspondents and collectors department. This portion of the journal is to be a chief feature of our publication.

Mr. H. C. Mercer in charge of field work for the University of Pennsylvania, has published a most interesting (although brief) report upon "The Progress of Field Work," in connection with his official duties in the museum. The report is remarkable, and should be closely studied. It bears the stamp of careful work, and is so concise that one can get at the facts in a moment. In the concluding paragraph of the report, after a brief description of a thorough cavern exploration we find the statement: "the notion of a pre-Indian Cave Man, as suggested by the implements of bone first found, vanished, and we were confronted again with the Red Man as the contemporary. It seemed, of the Peccary and Giant Chinchilla." Investigations such as Mr. Mercer and the University men have carried on, cannot be said to be hasty or careless. So far as the Delaware valley near Philadelphia is concerned, the editor thinks they have settled the question. The evidence submitted is most positive in its character. Would that they could do similar work in other valleys. The report will appear in full in the February number of The Archaeologist.

## COLLECTOR'S DEPARTMENT.

A very interesting letter has been received from Mr. Chas. A. Dily regarding the finding of specimens in glacial drift along the shores of lake Michigan. We quote the following paragraphs:

"No. 1 (of the drawings which he sends) was found embedded in the gravels of the fifth stratum of the ancient beach of Lake Michigan, some two miles distant from the present shore. No. 3 was secured in one of the clay beds (25 feet below the surface) which are of glacial origin. This is shown by the large number of glacial-scratched rocks of more northern origins,—even copper ore being found present.

"You will notice that No. 3 (also of bone, awl shaped) shows a clean cut, as if made with some sharp instrument. This fact together with the other fact that I extracted it out of compact masses of clay, 25 feet below the surface, at once tells the story the man who made it existed during the time when gigantic glaciers swept over Chicago.

"No. 1 is equally interesting."

After describing the geologic formation of the plains bordering upon the lake he says: "It must be remembered that one (of bone, awl shaped) was found embedded in the fifth stratum of the ancient lake beach. One is justified in laying claim to the theory that it too, is a relic of the Glacial period." He describes at length other specimens found at various depths along the old as well as the present lake shore. We would suggest that to avoid controversy and to aid in settling vexed and debated questions, finders of implements in real or supposed glacial drift should not remove them. An appeal on the part of a finder to any of the foremost

geologists in the country would result in an immediate investigation. Both sides know that such a procedure would settle the discussion. But it is those who cannot wait who find the specimens. There are some of us who would sit down by the object for days and nights if necessary and await the coming of some authority. But the people who are willing to do this never have the opportunity to exercise it, their searchings are in vain.

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### Information for Collectors.

*By Warren K. Moorhead.*

It is just possible that many of the readers of the *Archæologist* have not the time nor means to make a very extensive collection of prehistoric weapons, ornaments and utensils. Others, although business and professional men, may have devoted many leisure hours to traveling about the neighborhood purchasing specimens, or searching village sites for such implements as may be found upon the surface. Again, others are youths just beginning to collect, who may possibly have crude notions concerning many of the specimens which they possess, and be at a loss to know how to extend and enlarge a collection with but little expenditure of money. With the hopes that some "pointers" may be given to beginners and others, the editor undertakes this department. Each month some phase of collecting or of a collection will be considered. [Suggestions from all well informed collectors are welcome. It is not desired to confine the information to a few persons—all are welcome to express views.]

Collecting is both fascinating and instructive. I think those who live in the smaller towns and villages have an advantage over the city resident, and unless the latter has means with which to purchase specimens, the collector of the country is apt to have the



more valuable and important cabinet of the two. Local collections are of great value. That is, it is better to have all the stone, bone, clay and shell objects of one river valley than to own a mixed collection of specimens from all over the United States. Therefore, one ought to confine his selections, his finds, to a certain section of the country, and to well represent that rather than to attempt to show a large area imperfectly. I can call to mind but twenty-three men in the United States who have enormous collections of value from all localities. They are well along in life, not one of them has spent less than \$5,000, and many of them a large fortune in making an exhibit so broad that it would represent the entire stone age from the Columbia river to Mexico and across the continent to Maine. Out of the six or seven thousand collectors in this country there are but these twenty-three who have attempted to show all of the country and have done it well.

It does not follow that a beginning collector or one whose means and time are limited should be at all discouraged by these statements. Let me briefly outline, for instance, what a man living in a small town can do. Suppose he has seven or eight hours a week through the spring, summer and fall. He should first decide to make a collection from his own neighborhood say within a radius of thirty or forty miles from where he lived. If he had no experience and knew nothing about the subject he would do well to read current archæologic literature. He should talk with intelligent farmers (or with storekeepers who have an acquaintance with such people) and ascertain where large numbers of flint and stone implements in his county were found.

Then he should examine the country

near his town, watching what fields were put in wheat, oats and corn so that he would know when to start out upon a hunting trip to a given locality. He would soon ascertain by the broken stone, flint chippings, and fragments of pottery where a small or large village had been situated. He would become familiar with the large flint implements and axes found here and there. Most of the implements he would find would be rough and rude. His better finds would be isolated and rare compared with the great quantities of material which occurred upon the village sites. If he was inclined to be at all studious he would discover that he learned much more from a study of the village sites than from the more beautiful specimens occasionally found on the hill sides or upon the plain. A six inch flint spear head would be of more value to him as a collector; broken pottery, bones, partly worked implements, unfinished ornaments would be of more value to him as a student. He might notice the decorations upon the pottery and compare texture and markings with illustrations of the same from other regions. In a short time the beginning collector would find himself familiar with the class of objects which occurred in his neighborhood. His cabinet would have a real value, especially so if he could take some photographs of village sites or indicate upon a township map where the mounds, habitation sites, etc., were located.

The man who purchases all his specimens and who collects solely for the pleasure that he derives in possessing beautiful implements has a valuable cabinet in that its contents represent the art, and usually the highest art attained by aborigines. A museum which desired to be less scientific and wished to show the most

beautiful regardless of any study or development might desire such a collection. Its importance cannot be said to equal the former.

The class of men who have the greatest opportunity to make collections at small expense are country physicians and storekeepers. In the doctor's travels throughout his county he meets many farmers who have a number of specimens and it is therefore not surprising that the largest percentage of collectors are physicians. The storekeepers often exchange goods with farmers and thus secure many hundred relics yearly. I have often thought that were it possible to get one or two thousand collectors in the United States to note all the mounds, inclosures and village sites of their neighborhood upon township maps that we would soon have nearly all of the prehistoric monuments of United States recorded. France and England long adopted such a scheme and the archæologists in those countries know the exact location of every ruin, tomb, village site, burying ground, etc.

Concerning the cabinet in which to keep specimens little need be said. Any ordinary book case with large glass doors and shelves arranged so that they slant toward the front and thus clearly display the specimens will serve the purpose.

I would advise all beginning collectors not to attempt exploration. That is the one rule I would make inexorable. Whatever may be said against or in favor of the buying and selling of relics or the splitting up of complete finds, no beginning collector should attempt to explore mounds or graves. One should study and collect for at least five or six years. I will state my reasons as there are doubtless many who would take exception to the above statement. The prehis-

toric monuments of the United States are rapidly disappearing. The collectors annually destroy more than all the scientific institutions (combined) explore. Once destroyed, the history which an institution or an individual would obtain from a careful exploration is forever lost. Collectors have as much as they can do to gather the finds of their neighborhood and to purchase from farmers such things as they know to be genuine. It is not necessary for them to dig into ruins for the sake of seeing what they contain. It might be asked, how is one to know when he is competent to carry on explorations? When he has studied and read until he knows how others of unquestioned authority carry on explorations then he may do likewise and not until then.

In these notes for collectors it will be my policy to insist upon the preservation of antiquities. There are many good friends of mine who will read these words and possibly heed them not. I know several who have done an immense damage in certain sections by their investigations. When one feels that he is ready to open mounds and graves he should associate himself with a photographer or an artist (if he cannot draw or photograph himself) and in opening a mound he should cut a trench three-fourths of the width of the mound clear through from one side to the other. I do not mean a trench ten feet wide in a mound thirty feet in diameter, but a trench twenty-three or twenty-four feet wide in a mound thirty feet in diameter, and in like ratio. If he has not the time and the money to carry on the work as indicated he should let the structure alone. Everything found should be kept separated from finds from other mounds or sites. If a skeleton with objects is uncovered during the course of exploration, the objects and skele-

ton should be kept together and bear either the same number or the same series of numbers.

In a later paper this work will be taken up more in detail. Under no circumstance should decayed skeletons, logs, the ends of which show cutting with stone tools, broken pottery, animal bones, etc., be thrown away. If the collector does not desire such things in his collection, let him box them carefully, label them accurately so that in the future they may be studied. I would feel gratified if these suggestions should be observed by some of my friends as well as by the readers of the *Archæologist*.

(*To be continued.*)

## Jasper Implements in the Mohawk Valley.

(*By P. M. VanEpps.*)

A few notes regarding the use of jasper in the Eastern Mohawk valley may be of interest to some of the readers of this journal.

In searching the Mohawk river flats and adjacent regions for arrow-heads and such things as may be found in that line, one will sometimes, although rarely, find among the numerous flint chips, a chip or spall of yellow jasper and occasionally an arrow-head or some other implement of this beautiful material will be found.

These implements of yellow jasper are, as a rule, rather small, due perhaps, to the difficulty of obtaining the material of considerable size, for the supply was no doubt sought for among the water-worn pebbles of the drift and in the river beds. For with a little search among the pebbles of the river banks one can find pieces of a size sufficient for the smaller arrow-heads, but larger pieces are more rare. Two miles north from the Mohawk river, in Schenectady county, lies a curiously disposed range of low hills

consisting of stratified gravels and sand. These gravels, the refuse of Cambrian and Lower Silurian rocks, abound in numerous small, rounded fragments of fine yellow jasper. These pebbles seldom exceed an inch and a half in diameter.

The primitive maker of arrow-heads on the finding of a suitable pebble would no doubt split it by pounding or by the method described by Mr. Sellers in his article in the *Smithsonian report* for 1875. He would thus procure discs or flakes which, by chipping, might be worked similar to flint, although the material appears to be somewhat tougher.

I have in my collection an angular fragment of jasper, one and one-half inches in diameter and about one-fourth of an inch in thickness, which without doubt, represents the central part of a pebble as the edges still show the original surface. This flake was either lost or for some reason rejected.

The majority of jasper implements from this vicinity which I have noticed would seem to bear out this idea of their having been chipped from sections struck from pebbles, for as a rule, they are quite broad in proportion to their length.

This may be a fancy of mine, but it seems as though the maker of a jasper arrow-head was loth to waste any of the material at his command, for while he would be limited as to length, he would at the same time make his arrow-head, or whatever implement under way, unusually broad. Notice figures 1 and 2.



Fig. 1.

Figure 1 represents a neatly made arrow-head of yellow jasper, found at a camp-site near the Mohawk river, Glenville.

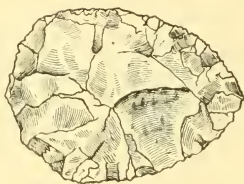


Fig. 2.

In Fig. 2 we have a leaf-shaped implement of a common form, but of a much finer quality of jasper than Fig. 1. It was found near an extinct lake or peat swamp about six miles north of the Mohawk in the western part of Saratoga county and is in the collection of Mr. H. McWilliam, who kindly allowed me to make a sketch of it for this article. Mr. McWilliam has made some interesting discoveries the margins of this former lake, which would seem to indicate that it was a place of resort for the Indians while yet open water. In a future

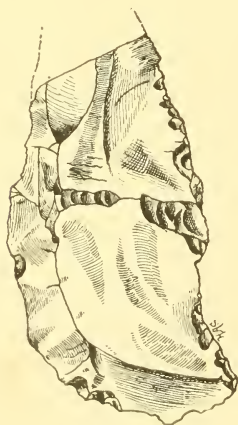


Fig. 3.

number of the *Archæologist*, I hope to be able to present something in regard to this matter.

Fig. 3 is a rude, unsymmetrical implement, which if made from blue or gray flint commonly used, would attract but little attention, but from the fact of its being a beautiful fine-grained jasper of light ochre color, most unusual for jasper in this vicinity, makes it an example of considerable interest. Possibly it has been secured by barter and carried some distance. What it was used for is uncertain, whether knife or scraper, as what apparently was the pointed end is broken away.

In these few remarks I have spoken only of yellow jasper. A few arrow-heads of red jasper have been found but as very little material is noticed in this region from which such implements could have been fashioned, it would seem reasonable to conclude that such have found their way from localities in which red jasper abounds either in the massive state as at Cecil county, Md., or in pebbles as found in other sections.

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NOTE.—A peculiarity of this particular camp-site was that among a large number of flint arrow-heads found nearly all were of the triangular form with concave base, while at a village site a mile distant all common types of arrow-heads are found. In a letter to Mr. Wm. H. Holmes, referring to this peculiarity, I have ventured the suggestion "that possibly the family of people living at site, made a specialty of the manufacture of triangular points." I might add that, beside my conclusions, three gentlemen interested in archæology have noted this same peculiarity and have all secured some of these triangular arrow-heads.

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## NOTES AND NEWS.

The Russian engineer, Melnikoff, writes from Odessa to the Smithsonian Institution, describing the ruins of an ancient canal discovered in the Crimea, which he regards as one of the wonders of the World.



At the end of the western side there was a lofty castle, the ruins of which remain to this day, the cubical contents exceeding 750,000 meters. A part of these stones, as well as those with which the bed of the canal was paved its entire length, were removed some time ago to build a town which adjoins.

During the Crimean war some of the stones remaining were utilized in the construction of hospitals for the wounded soldiers which structures are still standing. Along the banks of the canal there were at least six towers, but what purpose they served unless for defense, is uncertain. There was also a high wall, which extended its entire length. At an equal distance from each end there was a gigantic fortress built in the form of a square and covering a space of 32,400 square meters. The canal is as straight as an arrow its entire length except at this point, where it forms three sides of a square about the fortress. Here there was a smaller canal on the outer side which may have provided greater security.

One of the gateways of the fortress is still partially preserved and through it passes a dilapidated road. The canal was built by Assande I, of Bosphorus, in the seventh century, B. C. and is nine kilometers long. Mention is made of this in the writings of Pliny and Strabo. It passes by the modern town of Perekop and is not far from the Greek city of Neapolis. Its width on the bottom was about five meters and its depth ten meters. Whether it served formerly as a great and towering fortification or not, it certainly contained water enough to sail ships of considerable burden.—Scientific American.

the Editor and his wife were given passes for an extended trip through the South. During the time spent in Louisiana, Mississippi and Tennessee, a number of mound groups were inspected. The size and extent of them was a surprise to the Editor. The lower Mississippi valley contains fully as many tumuli as Ohio, yet the average half dozen Ohio mounds heaped together will not equal one of the Mississippi mounds, in size.

One group in particular is an exact duplicate of the Hopewell Group in Ross Co., O., only that it contains about seven times as much earth in its 22 mounds as did the famous Hopewell Group. It will cost at least \$10,000 and possibly \$12,000 to properly explore it. The central mound is 57 feet high, 600x700 feet base. We had better not say where it is located for fear some enterprising archaeologist should "get ahead of us." The small mounds are arranged about the central one as they were in Ross county. Pottery, celts, flint and other objects are scattered about the surrounding fields. There are some three hundred acres of village site. The group has never been even partly explored, and there is every indication that finds there will be simply enormous.

There is no danger of the people of the neighborhood digging; they are too poor and ignorant. Further, no relic collector with less than \$1,000 can do much damage. The five smallest mounds will cost \$200 each; the next five, \$400 each; one \$600; and one, 28 ft. high, 300x500 ft. base, \$2,300 to \$3,000. The mounds are both "flat topped" and conical. It is impossible to tell externally which will be richest. The Editor considers it the most remarkable group in the U. S., excepting only two, Cahokia and Etowah.

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Through the kindness of President Fish, of the Illinois Central Railroad,

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Mr. Chandler, of the Astor family,

is the only person of great wealth in America who is interested in ethnology sufficiently to head an exploring expedition in Africa. There are a number of rich individuals who have, to some extent, furnished funds to scientific institutions. Mr. Chandler is therefore an exception, and scientific men should welcome him. He is bright, well educated and progressive. The Archaeologist hopes to be able to furnish its readers some articles concerning his observations among the tribes of the Upper Congo and the plateaux about the Mountains of the Moon.

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### A Remarkable Ruin.

Just as the Archaeologist was about to close its forms for January the editor received, through his friend Mr. John B. Jewett, notice of a wonderful stone wall which exists in Southern Mississippi. The wall is first noticed in Copiah county, about eighteen miles southwest of Hazelhurst, the county seat. It has been traced for forty miles by Col. Dupre, a gentleman of high attainments, much interested in all scientific matters. (so far as the editor is aware the existence of this wall has never been known to archaeologists.) Just over the line from Copiah county the walls form a V, each side of which is about a hundred feet long. This is near Brandywine, Claiborne county. Again several miles west at Stonington on the Jackson & Natchez railroad the same peculiarity is observed. There is one statement which seems incredible to the antiquary, and must refer to a natural and not an artificial hill. It is: "At the eastern end of the wall there is a dome

shaped elevation nearly four hundred and sixty feet above the surrounding country. One side of the hill is perpendicular for three hundred and ninety feet. Another side gradually slopes down to the top of the wall. It surely must be that the wall joins on to a high, steep, natural hill. The lady acquainting Mr. Jewett with the wall says that it is "built of blocks of sandstone of denser and better quality than any found in natural strata in this country. The blocks are of uniform size, rough hewn, eighteen inches wide, thirty inches long and twelve inches thick. They are nicely fitted together with cement of a light yellow in color which can be scraped off in thin layers. This cement sometimes fills a flaw in the stone thus bringing it on a line with its fellow. Again, when a corner of a block had been broken it was mended by chinking up with stone and cement." She says that some stones containing impressions of foot steps have been found in the wall. She also adds that no investigations by scientific men have been made.

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On the shores of Lake Tedyuscong, named after a famous but cruel Lenape chief, was found the other day in a corn field a large number of chipped relics, grooved axes and skulls. The lake or pond is situated in the wilds of Pike county, northeastern Pennsylvania.

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Henry Villard, a rich New York citizen, has organized an expedition in charge of Mr. C. F. Lummis, to journey through Peru, Bolivia and Ecuador in quest of relics of the ancient life in those interesting countries.—Illustrated American.

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Several important communications have been received too late for this number of The Archaeologist, and will therefore appear in February.

Games

Folklore Religions

UNIVERSITY OF PA,  
IDOLS.

Pictures  
Yucatan Pottery  
E. H. Thompson.

R. J. Gunning.

A. PICTURES  
ARGENTINE  
REPUBLIC  
GOVT.

W. S. CHERRY  
UPPER CONGO E.  
E. REMENYI  
E. SOUTH AFRICA  
S. B. Lingle J. McMillan  
Lower Congo Africa  
E.  
C. L. DAVENPORT  
Africa E.  
SOUTH SEA ISLANDS E.  
Dept. M. Otto Finsch

NEW  
South Wales  
E.  
GOVT.

Zelia Nuttall  
Mexican. Cal.  
Costumes on Models  
Peru & Bolivia Dept. M.  
G. A. Dorsey, W. E. Safford.  
E. of Orinoco Valley. Dept. M.  
R. Welles.

EMILIO MONTES  
A.  
CUZCO PERU.

A.  
JAPANESE  
GOVT.

CASTS

A.  
GREEK STATUARY  
AND  
SCULPTURE  
GOVT. of GREECE

AUSTRIA  
Cave Bear  
Egypt  
A.  
De  
Potter

A.  
Mexican  
GOVT.

A.  
COSTA RICAN  
GOVT.

A. & E.  
BRAZILIAN  
GOVT.

WYMAN BROS.  
Mich., Wis., Ills.,  
& Mo.  
A.

CENTRAL AM'R'CAN  
A.  
CASTS & PHOTOS  
DEPT. M.  
E. H. Thompson  
M. H. Saville  
J. G. Owens

PARAGUAY  
GOVT.  
A. & E.  
E. Haslar  
In charge

BRITISH  
GUIANA  
GOVT.  
A. & E.  
J. J. Quelch  
In charge

Henry Haysen  
Wisconsin A.  
W. P. Philips  
C. H. Green  
COL.  
CLIFF  
DWELLER  
SPEC.  
NEW MEX.

COLORADO  
STATE  
A.  
A. F. Willmarth  
In charge.

SOUTH AMERICA  
A.  
DEPT. M.  
RECONSTRUCTED PERUV-  
IAN CEMETERY.  
Geo. A. Dorsey,  
F. A. Ober,  
W. E. Safford.

GAMES

Charnau's Central American

A. CASTS FRENCH GOVT.  
BERLIN  
MUSEUM  
CENTRAL  
AMERICAN  
A.  
CASTS

MAUDSLAY PICTOS  
CENTRAL AMERICAN  
A. BRITISH GOVT.  
HONDURAS  
GOVT.  
A. EXHIBIT.

NEW  
South Wales  
E.  
GOVT.

Nez. Perce E F. Starr  
Alice Fletcher Carolina E.  
Ontario E. Nova Scotia E. Eskimo E.  
Dept. M. Dept. M. Dept. M.  
T. P. Hall G. M. West Lt. R. E. Peary  
A. R. Tisdale

A. P. Henderson N. H. Chittenden  
Alaskan E. British Columbian E

BRITISH COLUMBIA  
Dept. M.  
Franz Boas,  
Phillip Jacobson,  
J. G. Swan,  
Myron Eells.

E.  
J. G. PEACE

SOUTH SEA ISLAND

D. B. DYER  
E.  
NO. AMERICA

E. E. AYER  
A. & E.  
NORTH  
AMERICA

E.  
Northwest Coast  
of  
North America  
Dept. M.  
Franz Boas.

NORTHWEST COAST OF NORTH AMERICA. E.  
Dept. M. Franz Boas, Geo. Hunt, Jas. Deans

MODEL OF VILLAGE OF SKIDEGATE.  
Queen Charlotte's Island. B. C. Dept. M.

MODELS OHIO  
EARTHWORKS.  
Dept. M.

MODELS PUEBLO  
BUREAU ETHN'GY

SEC. OF MINN.  
PIPE STONE.  
C. H. Bennett.

A.  
OHIO  
DEPT. M.

W. K. Moorehead,  
H. I. Smith.  
C. L. Metz.

Missouri  
STATE  
A.  
W. J. Seever  
In charge.

ARK. A. C. W. Riggs  
KY. & TENN. A.  
H. L. Johnson  
A. CAL.  
Dept. M.  
S. Bowers.  
ONTARIO.  
D. Boyle.  
A.  
MICH.  
H. I. Smith,  
E. S. Golsen  
INDIANA  
Dept. M.  
C. C. Willoughby  
CON.  
N. J.  
Dept. M.  
E. Volk.

Ohio  
Glacial  
Period  
& Man.  
G. F. Wright.

OHIO  
STATE

THE  
RUST  
A.  
COLLECTION  
F. G. Logan  
Owner.

TOILET.

ASSYRIA

ASSYRIA

Arrangement of Exhibits in Anthropological Building, World's Columbian Exposition.

EXPLANATION OF PLATE.—A. = Archaeologic. E. = Ethnologic. Dept. M. = The Department of Ethnology of the World's Columbian Exposition; F. W. Putnam, chief. The names following this abbreviation are those of the assistants under whose charge were carried on explorations. Size of name is intended to indicate size of exhibits. The map shows the main floor except the sections of Hygiene. Sanitation, charities and corrections, and covers a space 283 ft. long by 215 ft. wide. The major part of the archaeological and ethnologic material was exhibited as indicated on the map, very little of such material being in the gallery. The scale of the map necessitated the omission of some of the smaller, although no less important, exhibits. Points of interest not indicated on map: Ohio—Disks, stone grave open. Altars;—Moorehead. Photos showing successive steps in excavation, stone grave, maps.—Smith.





# The Archæologist.

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WATERLOO, INDIANA, FEBRUARY, 1894.

NO. 2.

## ARCHÆOLOGY OF PERU.

Continued.

[BY G. A. DORSEY, W. C. E. ASS'T TO PERU AND CHILI.]

 Has been previously intimated that there existed in ancient Peru four different peoples, in many respects closely related, but probably of different language stocks. It is an undoubted fact that at the entrance of the Spaniards into Peru, the two coast peoples had been subjected by the Incas or Quichua stock. The people of the north coast, or the Yuncas, had been conquered in the early part of the fifteenth century. The southern coast people, or Atacameños, had been conquered in very remote times. Besides these three stocks it is probable that still a fourth race existed in the great plateau of Bolivia to the south of Lake Titicaca. Whether the system of stupenduous ruins of Tiahuanaco can be ascribed to these people or whether they were built by the ancestors of the founders of Cuzco, is a question still undecided, and one that is wrapped in mystery. Certain it is that the ruins of Tiahuanaco are among the most ancient of this continent.

Let us now examine in some detail a representative community of these four peoples and in addition we shall take a hasty view of the plain of Tiahuanaco. The undoubted center and capital of the Yunca empire was at Moche, near the modern town of Trujillo, but my work in that locality was so limited that I must speak of some other locality belonging to the same empire.

The Santa Valley is easily the locality next in importance to Trujillo and is in many respects equally well known, but for some cause the contents of the graves, and this almost furnishes our sole means of knowledge, are by no means so well preserved as the less famous burying grounds of the south. Of necessity then we take Ancon as furnishing the best preserved and most complete evidences of the daily life, habits and customs of the ancient people. It is well to state here, however, that there are great differences among the three above mentioned localities and others in close proximity to the mint his part of the Peruvian coast. Whether these differences are due simply to local environment or are tribal peculiarities, it is now difficult to determine. Putting aside the differences we have just mentioned there are so many things

in common among these localities, there is so much of similarity in their textile fabrics, pottery, metal work and architecture that there was undoubtedly a constant bond of union between them so that what we shall say of Ancon will apply in a more or less general way to the different localities throughout the region. Of the details in the method of work and the exact position and order in which the graves occur in Ancon I shall not speak here, for in another place this has been done with some detail.\*

The first feeling one has after having examined any large quantity of material from Ancon is that the civilization there shown must be very ancient. There are evidences of this on every side. The Spaniards upon their arrival in Peru were struck by the large number of domestic animals possessed by the Peruvians. At Ancon the remains have been found of the llama, the vicuña, the dog, the guinea pig and many other small animals as well as many species of birds. The llama undoubtedly in its original state was one of the most timid animals in the world and probably the most difficult to domesticate. Yet for many hundred years the llama furnished the only means of burden for the ancient Peruvians as well as providing them with food and more important, wool for their clothing. Again, at Ancon are found many cereals, vegetables and fruits which had undoubtedly been brought to a high state of cultivation and Peru today produces the largest bean and the largest grain of corn in the world. In their textile fabrics they had reached a very high state of perfection and with the most simple looms they produced garments which for texture, design and artistic beauty are not surpassed by those of any other ancient people in the world. In one sense they had reached an equally high state of progress in ceramics. The pottery of Ancon, Chimbote and Trujillo, while not displaying the same artistic taste shown in the fabrics, yet for its usefulness, serving every purpose, and for its design, showing us innumerable phases of daily life as well as many mythological representations, is of the highest value and interest.

Another evidence of the remote antiquity is shown in the undoubted proof which the graves furnish for us of differences in wealth and rank. To what extent these differences prevailed it is now impossible to ascertain, yet that there were differences is easily seen. The strongest proof of wealth is shown in the garments or clothing worn by those higher in rank or wealth. The greater portion of the people wore long, sleeveless shirts made of cotton or llama wool. As the llama was domesticated and near at hand its wool could easily be obtained. The vicuña however, had never been domesticated and does not abound in nearly so large a number as the llama, but its wool is much finer than that of the latter; so that in many graves we find the occupants clothed, not only in garments of vicuña wool, but also provided with various forms of head-dress, which often were made gorgeous with gold and silver bands and great feather plumes. It is only in graves of this kind that such emblems of power as the war-club, ceremonial slings, painted tablets and a greater variety of foods are found. Such graves as these are generally covered with a well-made roof, often of several thicknesses. Although the majority of the men were provided with fishing implements of some sort, it is

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\*See my article on the "Necropolis of Ancon" in the supplement of the *Scientific American*, September 15, 1893.

only in the graves of the well-to-do that we find the wonderfully constructed nets, often 20 ft. in length and 10 ft. wide, thus showing that fish played an important part in their diet. It is a curious fact, however, that the hook and line have only been found in two or three instances at Ancon, while this method of taking fish prevailed south of Ancon as well as in Ecuador and Columbia to the north. These gradations in life apparently were not confined to the men, but applied equally as well to the women. In their graves are found the best class of work-baskets, weaving and spinning implements, ear-rings of silver and necklaces of stone and shell, often with a silver disc attached as a pendant, and silver bracelets. In fact the position of the women in general at Ancon seems to have been a very high one and their duties evidently were not of the menial order as is generally the case with primitive civilizations. Her garments are generally finer than those of the men and her graves were equally as well made and as often provided with roofs. That she did no agricultural work is shown in the fact that all agricultural implements are always found with men. Her chief occupation was weaving, making pottery and cooking, as the abundance of cooking vessels found in her graves testify.

Even in the graves of the children great differences are found, many of them being elaborately made with the body carefully wrapped, and accompanied by vessels of food and many images of clay and wood. It is a curious fact that many of the children have been found enveloped in dog skins. Perhaps they held same belief as the Zuñis who buried a dog with a child, believing that the dog would act as a guide in the after life. These people evidently were firm in their belief of material after-existence, as is proved not only by the great care taken in preserving the dead, but in obliterating every trace of the location of the grave. The body was preserved in its original position by means of the roof which prevented the grave from filling up and as the roof was placed a foot or more beneath the surface of the ever-shifting sand, its position soon became unknown. This probably enables us to account for another curious fact of the manner in which the bodies were wrapped. In all cases the position of the head is obscured.

This was done by building up the shoulders with leaves or plants to the level of the top of the head: the whole was then wrapped in cloth. In some cases the bundle so made was provided with a false head, made to resemble the human head as much as possible. This custom has prevailed throughout the west coast of America in a more or less modified form and its object was probably the same throughout, that is, to deceive the evil spirit which was supposed to enter the graves and deprive the bodies of their heads.

It is a curious fact that no remains of dwelling houses are found within several miles of Ancon and as the plain is today absolutely barren the question has often been asked, where did these people live? By many it is thought that their dwellings were at Sierra Gorda, where there are still existing adobe ruins of considerable extent. This is disproved, however, by the fact that the burying ground of Sierra Gorda has been found and there are so many marked differences between the contents of these graves and the graves of Ancon, that we must look for their habitations in some other place. If one takes the pains it is easy to recognize the remains of an ancient acquia extending today half way across the plain of Ancon. This undoubtedly in ancient times led

from the Chillon River across the plain and furnished an abundant water supply, while the innumerable evidences of occupation such as rafters, canes, cornstalks, potsherds, etc., found sometimes at a depth of three feet beneath the surface lead us to believe that the ancient village stood right on the burying ground itself and that their houses were not of adobe, but of loose cane structures such as the natives on the coast build today.

As to the age of this settlement and of the many others scattered up and down the coast we have no exact knowledge. That the beginning of the occupation of the plain of Ancon must have been many hundred years ago is abundantly shown, not only in the vast number of graves themselves, but in the evidence of different ages shown by the contents of the graves. So far as I know absolutely nothing has ever been found in any of the graves showing European origin or contact.

Although Ancon is the best known field for archaeological work in the Rimac Valley, there are many other sites of former habitation, which, with an equal amount of work, would yield results equally important. In the delta of the Rimac alone there are no less than twenty distinct ruins. The most important of these is at Lurin and is known as Pachacamac, famous for its Temple of the Sun. In proportion to its size there has been very little work done here and it will undoubtedly prove one of the most fertile sources for future workers.

The second and least important of the four great stocks of Peru is the Atacamano. The boundaries of the tribe are the 20th and 23rd parallels. They are probably related closely to the Quichua stock and were certainly subject to them from very early times. Their principal centers of habitation are centered throughout the Atacama desert, the best known being Iquique and Pisagua. They did not construct adobe villages as did the Yuncas and they depended for their living more on fishing than on agriculture, consequently their highest development is found in their fishing implements. These consist of the spear which was thrown from the hand, and the hook, the latter being made of bone or copper. They also used the bow and arrow which have not been found north of Arica. The bows are very rude and primitive and could not have been very effective. Their principal agricultural product was corn which never reached a very high degree of culture, although the use of guano as a fertilizer was well known. Their clothing differed but little from those of the people of the north, except that they wore sandals and more generally employed the wool of the llama in their cloth. Both in their pottery and in their textile fabrics they showed a much less degree of skill and artistic beauty than either the Quichuas of the Yuncas. In the art of basket-weaving, however, they had reached a high state of perfection and employed this art in the making of caps and head-gear. For journeying on the sea they used rafts or balsas made of three pieces of timber spliced together. Small models of the balsas as well as of the double-bladed paddle are often found in the graves. In wood carvings they were very ingenious and well made specimens of idols, images, spindles and tops are frequently met with. The skeletons found in the graves prove their people to have been of exceedingly short stature and the crania are generally artificially elongated. One of the specimens from the graves of Arica shown at the Exposition was that of a child of about five years of age with its head still bandaged in woolen yarns. At Arica



many of the graves opened have brought forth large quantities of gold and silver objects and many specimens of fabrics and pottery ornamented in such a way as to lead us to believe that these people were in frequent communication with the Quichuas and it is probable that the custom of artificially elongating the head by means of bandages was copied after them. So far comparatively little work has been done in this region, except at Arica, where almost every grave has been despoiled. There is probably more of interest at Pisagua than at any other locality of the territory covered by this tribe.

The third, and undoubtedly the most important people of Peru is the Quichua. Varieties of the Quichua language were spoken over a region two thousand miles in length and extending from near the Equator to thirty degrees south. Within this region are found many of the most important and best constructed ruins of the continent. The capital of the empire was from an early date at Cuzco and near it are found the most important ruins of Peru. In fact, the modern city of Cuzco, a place of about 75,000 inhabitants, is almost entirely constructed on the walls of ancient houses and temples. Many of the modern churches of the city as well as a large number of private houses are constructed entirely of the stones taken from the ruins. The most beautifully constructed ruin in Cuzco is that of the Temple of the Sun, now known as the church and convent of Santo Domingo. Near it stands the Temple of the Virgins and the palaces of several of the Inca kings. To the north of the city is the great fortified hill known as the Fortress of Sacsahuaman. The stones used in this fortress are the largest found in any ruin in America. They were brought from the ancient quarry Ollaypatu, distant seventeen miles. Many of the stones in the lines of the fortification weigh over three hundred tons. On the same hill and in front of the fortress is a very large stone, which by the lowest computation weighs eleven hundred tons. Tradition says that this, too, was brought from the ancient quarry. This, however, seems utterly impossible. A winding stairway has been cut around the stone and on its summit have been chiseled out seats which are highly polished and from here it is said that the successive Inca rulers with their court witnessed the progress of the building of the fortress. To the north of this stone is a small opening down among the rocks which, tradition says, leads by means of an underground passage down the face of the hill, across the city, until it terminates beneath the Temple of the Sun. The story is told of a couple of Cuzconians, who, many years ago, started in the morning down this passageway and reaching its termination in the afternoon, plainly heard above them the Dominican monks chanting the evening vespers. Certain it is, that there are many mysterious underground passages in and around this great fortress, and it is only with a feeling of awe that as one proceeds up the tortuous road, passing through great gateways and over stone viaducts, he hears beneath him at different points a mighty stream of water which tears down through its subterranean passage at a terrific rate, and in ancient times is said to have supplied the fountains in the public squares and in the inner court of the Temple of the Sun.

I have spoken of the quarry from which these stones were taken. It is seventeen miles from Cuzco in a south-easterly direction and is on the western side of the Rodadero River, a small stream taking its rise back of Cuzco. There have been endless theories formed as to the manner in which these

stones were transported, but none of them are adequate. The largest mining implements found today are in the nature of copper bars from two to three feet in length, but it is very probable that a great number of heavier implements were found by the Spaniards on their arrival.

[TO BE CONTINUED.]

## INDIAN NAMES FOR THE WINDS AND QUARTERS.

[BY REV. JAMES OWEN DORSEY.]

**T**HE present article consists chiefly of some of the results of personal observations made among tribes of the Dakotan or Siouan linguistic family since the year 1871, compared with notes taken when the author was on the Siletz reservation, Oregon, in the summer of 1884.

In the notation of the Indian words given in this article, all the letters and combinations of letters have their ordinary English sounds except those to which attention is now called.

The unmarked vowels have the continental sounds: a as in father; e as in machine; o as in no; and u as oo in tool.

ʼa is an initially exploded a.

ě is pronounced as e in *yet*.

i as in *pîn*.

û as in *but*.

n final as *n* in the French words *bon, vin, pain*.

dh as *th* in *the*. th as *th* in *thin*.

ddh, in Kwapa words, represents a *d* sound followed by a semi-audible or vanishing *th* in *the*.

gh approximates the Arabic *ghain*.

kh is as *ch* in German *ach*.

sh as in *she*; and zh as *s* in *pleasure*.

kʼ is an exploded *k* sound.

The plus sign marks a prolonged sound. In one of the Biloxi names, nyu is sounded as in the English word, *new*.

The Tutu tunne, an Athapascan people of Oregon, have the following names for the winds and directions:

Points or directions.	Winds.
North, te-ě	tan-yus-la
North-east te-ën-i	tan-il(thltsi?)
East n+i	nin-yus-la
South-east un-nën-i	un- nin-na

South un-ně	an-yus-la
South-west un-ne-sě	an-si-thłtsi
West s+ě	sin-yus-la
North-west té-e-sě	tan-sin-thłtsi

It will be observed that the name for north-east is compounded of the names for north and east, that of north-west, of the names for north and west, and so on; and this peculiarity applies to the names of the winds also.

The Omaha Indians of Nebraska call the east, Min ídhan tá-dhi-shan. Towards the coming sun; the west, Min í-dhe dhan tá-dhi-shan. Towards the departing or setting sun; the south, Gdha-din hí-de-a-tá-dhi-shan. Across (and) Down-stream; the north, Gdha-din í-tá-gha-tá-dhi-shan. Across (and) towards up-stream; and the north as well as the south is sometimes called, Gdha-din-á-ta, Across. In 1872, the Ponkas, a cognate people, told the author that the east was Hí-de-a-ta or Hí-de-a-ta-dhi-shan. Towards down-stream. At that time the Ponka tribe resided in what was then Todd Co., Dakota Ter. (but which has been transferred to Nebraska), near the town of Niobrara, Knox Co., Neb., where the approximate course of the Missouri river is east-south-east. That stream runs nearly southward past the Omaha habitát; and if, as has been suspected, the Omahas used to face the rising sun in the morning and the setting sun in the afternoon, as was the custom among their Osage kindred, during their ritual observances, it will be comparatively easy to trace the derivation of the Omaha names for north and south. No distinct names for the winds were recorded.

The Osage names for the winds are as follows: the north wind is Ta-tsé Pá-san tse (Wind Pine the). Wind towards the Pines; the east wind, Ta-tsé Ká-khpa tse, which, judging from the analogy of the name of another tribe, U-kákhpa, the Down-stream people, may mean, Wind towards down-stream. The south wind is Ta-tsé Á-k'a tsě, an archaic name whose meaning has not been ascertained; but it should be compared with the Kansa name for the south quarter, the Kwapa name for the west wind, and the Omaha personal name, Á-a-win, which probably means South-wind Female. The west wind is Ta-tsé Maí-ha tsě, Wind towards the Bluff or Cliff, perhaps, towards the interior of the country, as contrasted with "towards the river," reminding us of a similar usage in the Dakota language, khe-ya-ta, towards the hill country or interior, away from the Missouri river. An account of the Osage ceremonies in connection with the consecration of the mystic fireplaces will be given near the end of this article.

The Kansa or Kaw names for the four quarters are the following: the east is Bázan-ta. Towards the Pines; the south is Á-k'a (compare the Ak'a of the Osage and Kwapa and Áawin of the Omaha), the meaning of which is doubtless preserved in the secret society of seven degrees which still exists among the Osage and Kansa, and which has been described by the author in his article, "Osage Traditions," published in the sixth Annual Report of the Bureau of Ethnology. The west has two names, Á-k'a zhin-ga, that is, Small Ak'a or Young Ak'a, and Á-k'u-ye, the meaning of the latter being uncertain. The north is called, Hní-ta. Towards the cold. In this last name the "h" is sounded by expelling the breath through the nostrils. The two war gentes of the Kansa tribe sing mystic songs before going on the war path. An account of these songs and a copy of the war chart belonging to his gens were given to the

author in 1882 by Pa-han-le ga-khli, chief of one of these war gentes. On this chart there are twenty-seven pictographs of a mnemonic character. The fourth character, of which a sketch is given here, represents the four winds,



Wind symbol of the  
Kansa tribe.

who are gods. The Kansa warriors used to remove the hearts of slain foes, putting them in the fire as a sacrifice to the wind gods. The seventh figure on the war chart is the symbol of sacrifice. Before they reach this part of the ceremony, the leaders of the two war gentes (and perhaps their associates) face the south; but at this point they elevate their left hands (being Ya-ta people, or those whose gentes camp on the left side of the tribal circle), and begin at the left with the east

wind, then they turn to the south, next to the west, and finally to the north, praying to each wind and saying, "I give that to you, O Wa-kúnda." They used to pierce themselves with knives or small splinters, and offer small pieces of their flesh to their gods. A sketch of the Kansa war chart will be found in the American Naturalist for July, 1885, facing page 676 (Plate XX), as an illustration to the author's paper, "Mourning and War Customs of the Kanzas."

The Kwapa or Quapaw Indians call any quarter, Ta-dé u-í-ddhe. Whence the Wind Comes (or Blows), answering to the Omaha and Ponka name, Ta-dé u-í-dhe, and the Dakota Ta-té o-ú-ye, the Dakota name for the four quarters being, Ta-té o-ú-ye to-pa or Ta-tú ye to pa (topa meaning four). The following are the Kwapa names for those quarters: A-a is the west wind, not the south as among the Kansa and Osage; Ák'a i ddhe, the west wind and quarter (compare Ak'uye of the Kansa); Pá zi-té-ddhe, the east wind and quarter, reference being made to the pa-zi or pine trees; U-ká-khpa i-ddhé, the south wind and quarter, the term Ukakhpa, which is the tribal name, meaning down-stream; U sní i-ddhé, "the cold comes," the north wind and quarter. Another name for west is, Mi ú-khpe ta-ddhé-ddhe ddhú-shi, Towards sunset; but Mi úkhpe ta-ddhé-ddhe, while it, too, means, Towards sunset, refers to the south-west. Á-ka-hi-ddhá-ta-ddhé-ddhe, Towards down-stream, refers to the south-east. Mi ú-ti-nan-be-ta-ddhé-ddhe was given as the name for the north-east, and Usni hi ta-ddhe-ddhe, "In the direction whence the cold comes," as the name for the north-west. Some remarks on the name Ak'a will be found near the end of this article.

Next come the names given to the four quarters by the Iowa, Oto, and Missouri tribes. North is O-mé-ri-ta, Towards up stream. Two names are given for "east;" one authority preferring A-rú tce (or A-rú tshe), Across, the other, Pi a-ghé-we k'un-tá, In the direction of sunrise. South is called, U-ré-ku-ri-tá, Towards down-stream, and the west is, Pi kú-ye-ta, Where the sun is low.

The Winnebago Indians call the north, Wi ho-wo-shkú-ni-na. The sun does not go thither, another appellation which is rarely used being, Sin-i-ho-hu-é-tsha, (the place) Whence the cold comes. The east is Wí-a-khé-pu-é-tsha, At the sunrise. The south is Wi-o-we-dha, The sun goes thither. The west is Wi-o-wi-dé-dha, or Wi-o-ré-tsha, At the going (setting) of the sun. The north wind is called, Wa-zé-tsha hú-hi-tshé na, He continues (tshe, he stands) to come (huhi) from the Pines (Wazetsha). The west wind is known as, Dhe-kú hú-hi-tshé na, He continues to go down-stream, or towards the mouth of the river (dhe-ku, equivalent to urekuri of the Iowa, Oto, and Missouri), as the Missouri river flows south past the present country of the Winnebagoes. This



last is a modern name, as the removal of the tribe to Nebraska occurred about thirty years ago.

The Biloxi Indians of Louisiana call the north wind, *Khû-nû-mí*; the north (quarter), *Khû-nû-mi wá-de*, Toward the North wind. The east is *I-kû-nû-ku wá-e*, Towards changing weather, so called because rain is brought to Le-compte, Louisiana (the town near the Biloxi habitat) by the south wind. The west is, *I-ta-dû-ye* or *I-ta-dû-ye wá-de*, Towards sunset. The north-east is, *Na-tshí pso-hû-ye*, Corner of the cloud, but why it is so called, could not be ascertained. Names for south-east, south-west, and north-west are not used by the Biloxi.

The Dakota or Sioux Indians call the east, *Wi-yo-hi-yan-pa* or *Wi-yo-hi-yan-pa-ta*, Where the sun rises: the south, *O-kakh* or *O-ka-gha* (in the Santee dialect), that is, Down-stream;\* the west, *Wi-yo-khpe-ya-ta*, Where the sun sets; and the north is *Wa-zí-ya-ta*, admitting of two interpretations: 1. Towards the Pines(*wazi*), or 2. Towards the Waziya or winter spirit (who dwells in the far north). This Waziya is the enemy of another spirit, *I-to-ka-gha*, whose abode is in the quarter named after himself.

In the treatment of this subject it is important to consider for a few moments the cuts and symbolism of the winds and quarters. The number four appears very often, not only in the myths, but even in the religious ceremonies of many tribes, and attention should be given to the orientation of dwellings and tribal circles. Four enters into all mystic numbers: thus we have four plus three (seven,) and four times three, (twelve,) four, seven and twelve, being regarded as mystic numbers by the same tribes.

Among the Dakotas, the god of war and the four quarters is called, *Ta-ku shkan-shkan*, something that moves. He is supposed to live in the four winds, and the four black spirits of night do his bidding. Miss A. C. Fletcher has given a very interesting account of "The Religious Ceremony of the Four Winds or Quarters as observed by the Santee Sioux."—"Among the Santee Sioux Indians the Four Winds are symbolized by a raven and a small black stone less than a hen's in size. An intelligent Santee said to me: The worship of the Four Winds is the most difficult to explain, for it is the most complicated. . . The Four Winds are sent by Something that Moves. . . There is a Something that Moves at each of the four directions or quarters. . . These four quarters are spoken of as upholding the earth.†

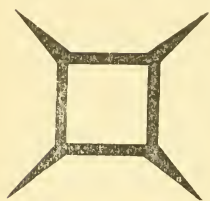
"My informant went on to tell me that the spirits of the four winds were not one, but twelve, and that they are spoken of as twelve."‡

\*Dr. S. R. Riggs says, in his Dakota dictionary, "Streams in the Dakota county flow southward."

†Geikie, in his "Hours with the Bible" (New York: James Pott, 1881), Vol. I, p. 55, has the following quotation from Das Buch Henoch, edited by Dillman, Kap. 17, 18: "And I saw the cornerstone of the earth and the four winds which bear up the earth, and the firmament of the heaven."

‡Report Peabody Museum, Vol. III, p. 289, and note 1 on that page. The use of the number twelve in connection with the ceremony of the four winds finds a counterpart in the initiation of an Osage female into the secret society of seven degrees still existing in her tribe. On such an occasion the female is rubbed from head to foot, thrice in front, thrice on each side, and thrice behind, twelve times in all, with cedar needles, the latter symbolizing the tree of life.

The four primary winds and their respective quarters are symbolized among the Dakota by what Miss A. C. Fletcher calls the "U-ma-ne." She describes it as "the square or oblong, with four lines standing out, which is invariably interpreted to mean the earth or land with the four winds standing toward it. The cross, whether diagonal or upright, always symbolizes the four winds or four quarters."<sup>§</sup>



The "U-mane" Symbol.

The raising of the pole used in a Dakota sun dance appears to be symbolic of the four winds or the four quarters of the heavens. The men raise it a short distance from the ground, and then stop and shout; after resting awhile, they lift it a little higher, and shout again; resting a second time, they renew their efforts, raising the pole still higher, but not till they have made the fourth attempt is the pole raised perpendicularly.

According to the testimony of the In-ke Sa-be, or Black Shoulder, a buffalo gens of the Omaha tribe, the ancestral animals found the east and south winds bad ones, but the north and west winds they regarded as good. On the other hand, an Iowa man told the late William Hamilton, his missionary, that the south wind was a beneficent one, the evil one being the northwest wind. This variation may be caused by a difference in the habitats of the tribes referred to.


Among the Kansa or Kaw and the Winnebago, Indian lodges were constructed with entrances facing the east. And in a Winnebago tradition, Ma un na or Earth Maker is spoken of as creating this world while sitting upon a small piece of ground and facing the east. When the Winnebago informant was asked why the God faced the east, he replied, "The east is the source of all light and knowledge." The opening of the Omaha tribal circle was represented as facing the east, that is a mystic or hypothetical east. The actual direction faced depending upon the direction in which the people were journeying.

The Tsi-shu man of the Osage tribe consecrated each mystic fireplace by placing four sticks in the form of a cross, beginning with the stick at the west (corresponding to the left side of the tribal circle, where the gens camped), and then laying the sticks at the north, east and south, respectively. But the old man or priest of the Panh-ka gens of the same tribe, being a member of a gens camping on the right side of the tribal circle, began with the stick on his right, on the east, and then laid the sticks at the south, west and north, respectively. Here comes up several questions: Of what wood was each stick which was thus employed? Was each stick of a different kind of wood? As the Osage name for the north wind is Wind towards the Pines, was the stick placed at the north a pine stick? The author hopes to find the correct replies to these queries during the coming winter, as he expects to spend some time among the Kwapa or Quapaws. For more detailed of what he has written concerning orientation and the symbolism of the four quarters he must refer the reader to an article in the *American Naturalist* for February, 1884, entitled, "An Account of the War Customs of the Osages," and his article entitled, "A Study of Siouan Cults," in the 11th Annual report of the Bureau of Ethnology.

<sup>§</sup>Miss Fletcher, in Rept. Peabody Museum, Vol. III, p. 284, note.

## SOME PREVALENT MISTAKES CONCERNING AMERICAN ABORIGINES.

[BY GERARD FOWKE.]

OR nearly a century now, travelers have recorded their observations of the structures pertaining to the former inhabitants of the Mississippi Valley, and desultory notices of them may be found at even an earlier date; for the Trappists long ago established a monastery on the largest of the famous Cahokia Mounds opposite St. Louis, which for this reason was at one time known as "Monks' Mound," although this name has been replaced by the one so much more appropriate.

At first, all these structures were attributed to the Indian tribes who then inhabited the region where the works occur, or to their immediate predecessors: at any rate there was as yet no thought of traveling down the misty corridors of antiquity in search of some other and "widely different" people to hold accountable for their construction. Some fifty years ago, however, E. G. Squier, who had removed from New York to Chillicothe, Ohio, in conjunction with Dr. Davis located near there, devoted about three years time to the examination of the earthworks and excavation of the mounds of which more than five hundred existed in the county. They also extended their researches over other portions of Ohio and used liberally the contributions of correspondents in various parts of the Mississippi Valley. Finally the results of their investigations were given to the public by the Smithsonian Institution in a large volume which came as a revelation to students and intelligent men everywhere, who were mostly ignorant, or at best had heard, vaguely, of the wonderful remains now for the first time minutely described.

Just here began the misconceptions and erroneous beliefs which have become so firmly implanted in the minds of nearly all persons who are interested in the science but have not been in position to investigate carefully the statements upon which their beliefs are based. The authors in question give numerous measurements, along with many plates and figures, purporting to be the result of actual personal observations. But their correctness has been successfully impeached in nearly every instance where surveys have been carefully made with accurate instruments. Indeed, there are numerous instances in which their own statements are contradictory, notably where they give the diameter of an enclosure, wrongfully said to be a perfect circle, as eight hundred feet, and yet claim to have laid off within it a regular dodecagon with a perimeter of thirty-six hundred feet! Moreover, all their lines are a certain number of feet in length: enclosures contain exact acres; angles are turned off only in degrees. This would be impossible, unless the builders of these works had the same system of mensuration that is in use among ourselves. Further, it is stated that regular geometric figures are the rule: that there are perfect circles, squares and octagons, and evidences of considerable astronomical knowledge in the manner in which these are laid out relative to the cardinal points. Such assertions are not true in a single instance: none of the enclosures require for their construction a degree of mathematical

ability beyond that of any person of ordinary powers of observation. Even in minor matters of detail, as in the accounts of mounds opened, subsequent explorations have shown them to be inaccurate. Withal there is apparent an honesty of purpose, a simplicity of style, which plainly show a desire to represent matters as they appeared to the investigators. There is no striving for effect, no desire for notoriety; if there had been, their volume could never have secured such reputation. Their mistakes are not due to intentional deception, but to errors of judgement. They plainly did not realize the importance of the work they had undertaken, nor did they dream of the value which their report was to gain in after years. For these reasons, while great credit is due them on account of their arduous labors for which they never received any adequate return, and for having brought to the knowledge of the world much that would otherwise have perhaps remained unknown, their work has to a considerable extent been responsible for many stumbling blocks in the pathway of the modern archæologist.

And yet Squier and Davis are less at fault than are many succeeding authors who carry to an unauthorized extent the fanciful conceptions that have seemed the logical outcome of alleged measurements and resemblance among aboriginal remains. The exactness with which square or circular enclosures were said to be laid off was considered abundant proof of the use of mathematical instruments and knowledge of calculations based on their use. Their purpose being beyond the reach of ordinary imagination, the conclusion was soon reached that they were intended solely for religious exercises. No explanation has ever been vouchsafed as to the kind of ceremonies that would require for their performance areas of twenty, thirty or even seventy acres in extent and even then sometimes connected with others of a similar size by passages perhaps more than a mile in length and concealed from curious eyes by walls of earth, palisades and wooden roofs fifty to two hundred feet wide. We find among the most primitive races ceremonies and sacrifices of personal comfort due to a sense of religious duty and some of the grandest architectural achievements of human intellect owe their accomplishment to the same feeling; but we nowhere find in the records of travelers in any age or country that races or tribes, whose mental abilities are so limited they can give no greater outward expression to their highest feelings than by piling up heaps of earth, whether symmetrical or not, have possessed so comprehensive and connected a system of religious ideas as would lead to the construction of immense and elaborate works for their observance, to the exclusion of similar or equal structures for the requirements of social or military needs.

The mounds, also, have had attributed to them uses and motives for building that do not appear justified by facts. Nearly all that have been opened contain human remains, or in case of low or flat mounds where the percolation of rain or surface water would destroy all osseous remains, the arrangement and character of specimens found indicate the interment of bodies all traces of which have disappeared. There are a few whose internal structure and the absence from them of artificial objects leave us in the dark as to their purpose. Some of these, notably the larger ones with flat tops, were obviously intended to be surmounted by buildings of some description, but the term "temple mound" as applied to such is not altogether warranted, for other buildings such as dwellings for the chiefs, assembly rooms or council houses



for deliberative purposes, or even store houses for grain and other provisions were thus elevated above the common level among tribes historically known; and we cannot suppose, without some basis beyond mere assumption for the opinion, that the Mound Builders had no structures of this sort. It is not intended to deny that superstitious beliefs may have exercised a commanding influence upon the tribes to which such works owe their existence: but to predicate these motives simply because such monuments may have been erected on account of them is certainly illogical.

"Signal Mounds" or "Mounds of Observation" are favorite appellations for conical piles on hill-tops. The position of these is opposed to their implied use, rather than confirmatory of it. Head lands and high peaks have always been favored burial spots among Indians, even until the present generation; and human remains are of such common occurrence in mounds thus situated as to warrant the statement they are simply tumuli. Besides, it is unreasonable to think that, on a point dominating the surrounding region for many miles, a heap of earth would be placed merely to raise a signal fire a few feet higher when no possible advantage could be derived from so doing, or to enable a sentry to elevate himself to the same extent when his horizon was already far beyond the limit at which he could discern a moving object.

Hence, whatever the object of the large enclosures (those of a few yards or rods in diameter were probably the sites of roofed buildings), the question of their being in any wise "sacred" in their nature must be abandoned; and as to such mounds as are not plainly for mortuary purposes it can only be said they may have been substructures for buildings of some sort, though not necessarily of a religious character—or else were for some unknown use which can only be guessed at in the absence of a definite knowledge of the Mound Builders' beliefs and ruling motives of action.

Equally erroneous with the popular idea of the uses of these structures, is the prevalent opinion that all such remains, wherever found, are the work of one race or people. With this supposition as a back-ground, there has been pictured out a dense population of busy people living in harmony under a set of fixed laws, despotic or beneficent, as may seem to the author best adapted for bringing about such happy conditions—tilling the soil, paying tribute, assembling periodically for adoration to a Great Spirit, homage to rulers, national games or religious festivals—owning and occupying the whole country from the Alleghanies to the Great Plains, from the Gulf to the Lakes, digging mica in the east, mining copper in the north, diving for shells and pearls in the south, gathering obsidian or agates in the west, working flint quarries in various parts of the Mississippi Valley, practicing unknown and unknowable rites in the Scioto and Kanawha Valleys, animal feticism in the northwest, sun worship farther south, far advanced in civilized arts, with priest-hood, aristocracy, well-developed manufactures of fictile and textile art, and all this wondrous, complex state of affairs evolved from piles of earth that demanded only ordinary sighting and easily contrived measuring apparatus to originate, with patience and brute strength to execute, aided by the excavation from tumuli of articles ecstasically proclaimed to be equal in handiwork to those made by the potters, sculptors and lapidaries of a high civilization!

Not only are remains of one particular class confined as a rule, to one cer-

tain section of country, but the remains of a given area, within the Mississippi Valley region will often give evidence of occupation by two or more separate races. That is to say, the great so-called "sacred enclosures" are found in the area included within the latitude of Central Ohio and Central Kentucky and the longitude of the "Panhandle" of West Virginia and the Lower Wabash, the "garden beds" are mostly in Michigan and Wisconsin, the "effigy mounds" in Iowa, Northern Illinois, Wisconsin and part of Minnesota, the great hill-top fortifications in Ohio, the pyramidal, flat-topped mounds in the Gulf States and up the Mississippi nearly to the Illinois River. A very few of any of these classes may be found in localities at a distance from where they seem to belong, and, conversely, in all these places may be found aboriginal remains so diverse from the prevailing type as to make it appear they belong to a different period of construction, or unrelated tribe of people.

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It is a common belief that the Mound Builders differed considerably in size from later dwellers in the same region and also presented peculiarities in the formation of bones and teeth that mark them as a "race apart." Very frequently we see a notice of some skeleton said to be of "gigantic size" merely because his jaw-bone will slip over that of a "large man," who is generally present, "whiskers and all;" or of a thigh bone, which, applied to the corresponding portion of a "very tall man," who also manages to be on the spot at the proper time, will extend beyond the latter's knee. As to the jaw-bone, any one of them being narrow or pointed at the chin and diverging toward the rear will easily fit over a portion of the outside of another; the inner jaw, if it were possible to make the experiment, would as readily slip over the supposed gigantic one. Again, not more than one man in a dozen knows exactly where his thigh bone begins or ends, consequently his reported comparison is very fallible. But the lower jaw of a Mound Builder or Indian is usually disproportionately large as compared with other bones of the skeleton, for which reason the opposing incisor teeth in a majority of the skulls meet squarely, instead of having the upper ones overlap as is more common in the Caucasian skull, and the coarse, tough, gritty food which they served to masticate and which required the undue development of the jaw to afford the necessary strength caused them to wear off flat on the crowns. This has given rise to the theory of "double teeth [molars] all-around" something that occurs in no variety of the human race.

There were of course many abnormalities in their anatomical structure—it would be strange indeed if they were the only people on earth free from them, there is no essential difference in form or size of mound skeletons from those of any other people spending most of their time out-of-doors with plenty of pure water and coarse but nourishing food. Owing to the hardship and exposure incident at times to their manner of living, the weak, sickly or deformed would perish in infancy, or childhood and not survive to afflict the community as is so much the case among people who consider it a duty to tax the vigorous in order to support and propagate the feeble, foolish or vicious.

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Allusion is made above to the professed superiority of relics from the mounds over those found on the surface or known to be the product of modern savage industry. But whether we consider our own country alone, or extend our

studies to the primitive races in other portions of the globe, we find a great similarity in weapons, implements or ornaments everywhere, so far as the skill and labor involved in their manufacture is concerned. A form suitable for the object in view having been devised it would be adhered to, with minor modifications made necessary by the different quality of the material that must be utilized or planned to meet the taste of the maker. All savage races would soon reach the limit of originality of design, whether in bone, horn, clay, stone or fibre, owing to the lack of means to carry out any new idea that might arise in the artisan's mind. Therefore a decided advance in adaptation of the means at hand to the end desired, would be a distinct advance in culture, and here is where the Mound builder is found lacking. What he may have done with perishable material, as skins or cloth, we can not know; but so far as wood carving is concerned it would seem impossible to excel that of many of the Pacific Islanders with the shell or stone tools at their command. They certainly did not equal the latter in magnitude of their human statuary and are so far behind the Mexicans as not to be compared with them. Their pottery does not equal that now made in Zuni, nor does it hold a fair place with the prehistoric ware of that region. The objects of chipped, pecked or ground stone, whether for useful or ornamental needs, are no more delicate, symmetrical or superior in execution than similar things made by ignorant tribes within a generation or two.

To avoid tiresome iteration it may be said once for all, that so far as present knowledge goes, whether we depend upon history or the mounds themselves, there is nothing in the structure, size, or contents of their works to show that the Mound Builder of popular fancy ever existed; or that the *real* Mound Builders ever attained to a higher degree of civilization, or rather, never came any nearer attaining civilization: than the Muskogean or Iroquoian stock and so far as we know to the contrary, the latter may have taken the lead.

Concurrent with the apotheosis of the "mysterious" Mound Builder has been the immolation of the oft-times too palpable Red Indian. The expression attributed to Gen. Sherman that "the only good Indian is a dead Indian" has struck the popular fancy somewhat in the same way that the alliterative jingle "lickin' an' larnin'" appealed to the denizen of Hoop-pole township in the Hoosier Schoolmaster story and has about the same amount of truthful ingredient.

The tincture of brutality inherent in mankind and from the influence of their surroundings manifesting itself more openly in those people who are nearest to nature in their daily life than among those who have to submit to the restrictive censorship of the legally constituted guardians of civilized morality, has by common consent been taken as the index of Indian character. The ferocity and implacability of enraged savages who know no other satisfactory methods of redressing grievances, real or imaginary, than by the infliction of physical injury upon the objects of their wrath, have served as a gauge wherewith to measure the ethical and intellectual qualifications of all who happen to resemble them in color; while superficial study with careless vision and unreflecting or prejudiced mind of the ordinary life of an Indian community has established equally erroneous notions concerning its social and domestic regulations. According to conventional belief the adult Indian is stolid, lazy, dull, morose, surly, revengeful and treacherous; spending most of his time in every

sort of dissipation possible to his somewhat limited opportunities: hunting or fishing only when the imminence of starvation makes it absolutely necessary for him to do so, roused to active exertion only by the prospect or possibility of chasing down a weak or defenseless neighbor and tearing his scalp off and to accomplish even this preferring to have the advantage gained by hiding in a thicket and shooting arrows into the back of his unsuspecting victim. Utterly improvident, he takes no thought of the future, but gorges himself like an anaconda as long as food is abundant and then stoically starves until the pangs of unendurable hunger drive him forth in search of sustenance. Rather than be at the pains of providing himself with a decent protection from the weather, he submits to all the discomforts and hardships of rigorous winters, crouching over the feeble blaze of a few sticks, beneath a torn and tattered teepee, half-clad in skins and coarse robes that only serve to mock his shivering nerves. He is devoid of honor, integrity honesty, and totally lacking in the chivalric instinct that impels a brave man to allow an adversary complete equality of terms in combat. Lacking in natural affection, the sick, the infirm, the aged, the helpless from any cause, are left by him to languish in distress or to have all peace and comfort banished by the hideous disguises, uncouth antics, nerve-rending howls and grewsome incantations of the medicine-man's "pow-wow." The dead he hastily wraps in skins and hangs in a tree for the crows to pick, or inters in a shallow hole dug barely deep enough to hide the corpse from sight.

It has become almost axiomatic that the culture of a race finds an unerring mark in the treatment which is accorded to women by the presumably superior sex. Here, again, do the disclaimers of commendable traits as a component part of Indian ethical composition think they score a point. Much sympathy is expressed for the poor women who are forced to undergo all the drudgery, toil and privation unavoidably attendant upon the manner of life in which they are compelled to spend their dreary, monotonous days. While the husbands and brothers are lounging about the wigwams, gambling, drinking, or recovering from the effects of a debauch, leisurely smoking while reclining on a grassy slope, or fishing when they can muster sufficient energy to undertake such a task, the squaws must till the stubborn ground, amid roots and stumps, or in a tough sod, with rude implements of horn or bone or wood or stone; plant, cultivate and gather the corn, beans and pumpkins which are to keep life in their half-frozen bodies through the winter; cut up such game as may be brought in to them from time to time and dry or smoke for future use so much of the flesh as is not at once devoured; daily spend hours in rubbing between two flat stones corn or acorns to provide bread; range through the forest hunting for fallen timber which they can drag home for fuel; toil on their knees day after day dressing skins of animals to make wearing apparel or covers for their miserable apologies for houses; make pack-horses of themselves for the transportation of their belongings when seeking a new home and with all this have to submit meekly and uncomplainingly to every manner of contumely, abuse and ill-treatment.

This is all true as applied to some Indians and partially true of most Indians; and there is not a country nor a race of people, anywhere on the globe to which the same charges are not applicable to a greater or less degree. There is not a large city in the civilized parts of the world where are not congregated hundreds and thousands of individuals belonging to the foremost nations who are



as depraved and cruel as the assumed "typical Indian" above portrayed and who are restrained from the commission of innumerable hideous crimes only by the knowledge that detection is almost certainly followed by punishment. As to the shiftlessness alleged against the savage, no one who is familiar with the cohees, crackers, pikers, sandhillers, tackeys, tikes and clayeaters scattered all over the South and Southwest, or the loafers in small river towns can claim any superiority for the whites. Nor is the condition of woman among our poorer agricultural and laboring classes so much superior as to allow the student to lay the flattering unction to his soul that he has here a measure of comparison that must always decide in favor of the white man. It is safe to assert that on all the smaller and many of the larger farms in the northern and western states and in all our tenement houses, nine-tenths of the white women, with families of average size, have an unceasing round from daylight until late at night, winter and summer, year in and year out, of worry and planning and onerous physical labor that not one-tenth of the Indian women or women of any of the lower races have or ever had or would endure.

All this, of course, is no excuse for the savage; but it admonishes us not to boast too soon nor too loud nor too often; and not to be hasty in asserting superiority of caste, as a race, with the treatment of the weaker sex as a proof. Neither can the issue be avoided by saying that these are the worst elements of civilization and not to be considered in estimating the status of our own people for they are not the worst and are not more accidental or more of a residuum than are the "typical" classes on whom most writers are inclined so flippantly to pass judgment in pluming themselves on the "vastly higher plain of excellence which our race occupies."

The easiest way in which we can arrive at correct understanding of the whole matter is simply to say there is neither truth nor justice in the general belief regarding our territorial predecessors. It is based altogether upon hasty and careless observations of degraded persons or families who have been contaminated by association with our vaunted "superior race." The models and types are chosen from natives who have accustomed themselves to the conditions of life necessary to their survival while commingling with frontier barbarianism. Despised, despoiled, swindled, treated as outcasts by the truculent, as legitimate prey by the seekers after the almighty dollar, the native American who still remains within the domain successfully claimed by the whites, is not undeserving of the low opinion in which he is held by them. Such as contend for their rights, manfully resist aggression and resent imposition, refuse to submit to unjust and inconsiderable deprivation of their natural privileges, are branded as remorseless savages whose extermination is a righteous and natural duty. From such as are willing to accept existence deprived of everything that can make existence desirable, "models" are chosen by most of our writers whose statements and conclusions are unthinkingly accepted by their readers who have had no opportunity to judge for themselves. The examples of Logan, Tecumseh, Pontiac, Cornstalk and a score of others whose names shall be as enduring as American history—for they have helped to make it—shows the absurdity of views usually held. These men could not have been possible in degraded and bestial tribes; the laws of heredity disprove such assumption. The history of almost any tribe that has ever lived in the Mississippi Valley will prove them to have been a vigorous, hardy race. No farmer

works so hard as a hunter when subsistence depends upon the results of the chase. The squaws did not, in all cases, cultivate the ground unaided; the men often took part. But it was not considered properly their duty. With hostile tribes on every side, with hundreds of square miles of forests which must be traversed in search of game, with the manufactures of weapons and other things necessary for their assigned duties, the men found their time fully occupied. House-keeping from an Indian point of view, was a light matter: the women had ample time for the fulfilment of out-door labor as fell to their lot; and it was not, as carried on by them, an onerous task.

If the reader will lay aside popular and juvenile books on the subject, and in their stead read Morgan, Catlin, Carr, the chronicles of the early Spanish and French explorers of the Valley, and others who have studied the *natural* Indian, a great surprise is in store for him.

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### INDIAN WRITTEN LANGUAGE.

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**T**HE following very interesting incident of Indian life, was written by Gen. Cass many years ago while on one of those numerous missions to the aboriginal tribes, in which his integrity, sagacity and deep knowledge of the Indian character, achieved so many beneficial results for the United States as well as for the outcast children of the forest themselves. He says: An incident occurred, during a recent tour of the north west, so rare in itself and which so clearly shows the facility with which communications may be opened between savage nations, without the intervention of letters, that I have thought it would be interesting to communicate to you.

“The Chippeways and Sioux are hereditary enemies and Charlevoix says they were at war when the French first reached the Mississippi. Believing it inconsistent with humanity and sound policy, that these border contests should be suffered to continue I proposed to the Chippeway chiefs, that a deputation should accompany us to the mouth of the St. Peter’s, with a view to establish a permanent peace between them and the Sioux. The Chippeways readily acceded to this proposition.

“The computed distance from Sandy Lake to St. Peters is 600 miles and as a considerable portion of the country has been the theater of hostile enterprises. In this debatable land the game is very abundant. Buffaloes, elks and deers range unharmed.

“As we neared this part of the country, we found our Chippeway friends cautious and observing. The flag of the United States was flying over all our canoes, and, thanks to the character which our country acquired by the events of the last war, I found, in our progress through the whole Indian country, after we had once left the great line of communication, that this flag was a passport which rendered our journey safe.

"The Chippeways landed occasionally to examine whether any of the Sioux had recently visited that quarter.

"In one of these excursions, a Chippeway found in a conspicuous place a piece of birch bark made flat by being fastened between two sticks at each end and about eighteen inches long by two broad.

"This bark contained the answer of the Sioux nation to the proposition which had been made by the Chippeways for a termination of hostilities.

"So sanguinary had been the contest between these tribes, that no personal communication could take place.

"Neither the sanctity of office or the importance of the message, could protect the ambassador of either party from the vengeance of the other.

"Some time preceeding, the Chippeways, anxious for the restoration of peace had sent a number of their young men into these plains with a similar piece of bark, upon which they had represented their desire. The bark had been left hanging to a tree in an exposed situation, and had been found and taken away by a party of Sioux. The proposition had been examined and discussed in the Sioux villages, and the bark which was found contained their answer.

"The Chippeway who had prepared the bark for his tribe was with us; and on our arrival at St. Peter's, finding it was lost, I requested him to make another. He did so, and produced what I have no doubt was a perfect facsimile. The Chippeways explained to us with great facility, the intention of the Sioux, and apparently with as much readiness as if some common character had been established between them.

"The junction of the St. Peter's with the Mississippi, where the principal part of the Sioux reside, was represented, and also the American fort, with a sentinel on duty, and the flag flying.

"The principal Sioux chief was named 'Six,' alluding, I believe, to the band of villages under his influence.

To show that he was not present at the deliberation upon the subject of peace, he was represented on a smaller piece of bark, which was attached to the other.

"To identify him, he was drawn up with six heads and a large medal. Another Sioux chief stood in the foreground, holding a pipe in his right hand and his weapons in his left. Even we could not misunderstand that, like our own eagle, with the olive branch and arrows, he was desirous of peace but prepared for war. The Sioux party contained 59 warriors, and this number was indicated by 59 guns, which were drawn upon one corner of the bark.

"The only subject which occasioned any difficulty in the interpretation of the Chippeways, was owing to an incident of which they were ignorant.

"The encampment of troops had been removed from the low grounds upon the St. Peter's to a high hill upon the Mississippi; two forts were therefore drawn upon the bark, and, the solution of this enigma could not be discovered until our arrival at St. Peter's.

"The Chippeway bark was drawn in the same general manner, and Sandy Lake, the principal place of their residence, was represented with much accuracy. To remove any doubts respecting it, a view was given of the old north-western establishment, situated upon the shore.

"No proportion was observed in their attempt at delineation. One mile of the Mississippi, including the mouth of St. Peter's occupied as much space as the whole distance to Sandy Lake, nor was there anything to show that one part was nearer to the spectator than another: yet the object of each party was completely obtained.

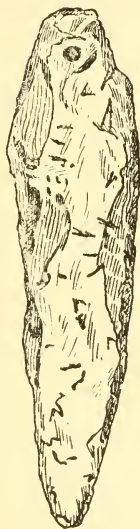
L. H. BEESON

### A PENDANT.

[BY A. F. BERLIN.]



N the writer's possession is a partly chipped and partly polished arrow-head-shaped perforated specimen, made of red shale belonging to Mr. Charles Klopfer, of Somerton, Pa., which was picked up from the surface in the vicinity of Reading, Pa., about twenty years ago. Here, the material from which the object was made is found in place. It is two and three quarter inches long, and, as seen in the cut, is perforated, which was done from both sides, forming a somewhat funnel-shaped perforation, through that part which at the arrow-head we term the stem. Although it would have done good service as a point attached to a shaft, it was undoubtedly worn as an ornament. Pendants of this form seem to be somewhat rare.



Arrowhead ornament.

The writer saw several years ago in the Stubb's collection belonging to Lehigh University, Bethlehem, Pa., a similar ornament of about the same length but broader. It was made of slate, nicely polished, perforated four times, once through the stem, another near the point, and the remaining two were placed at opposite points in the body, I think all the holes were connected by incised lines. The writer visited the museum building a short time ago to inspect the relic, but found it missing. As some of the glass panes of the cases in which the stone objects are exhibited were at the time of the writer's visit broken, he is forced to believe that it was taken away.



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## EDITORIAL.

### Archaeology in the Central States.

The oldest institution in the Central States which can lay claim to good work in archaeology is the Cincinnati Society of Natural History. Before any of the more progressive modern scientific institutions west of the Alleghanies were founded, it had published numerous reports and made a creditable and an intelligent collection. Its work dates from 1870. Along with it should be mentioned the Western Reserve Historical Society of Cleveland, which is much older and so far as history is concerned its work out-ranks any of the western institutions. In archaeology, Col. Whittlesey, who was long connected with it, did good work.

The Cincinnati Society especially distinguished itself in the exploration of the Madisonville pre-historic cemetery. Its work there was of great importance and value. It did not simply content itself with making an examination of a small section of the site and mounting with meagre labels a few hundred relics arranged (as is too often the case) with scrupulous care as to forms: the triangular arrow-heads all together, the celts laid out in rows etc. It instituted a thorough exploration. It asked the doctors and anatomists among its members to identify the bones found in the ash pits of the site, to report upon the human skeletons as to physical peculiarities, diseases, etc. It asked eastern and foreign archaeologists to pass opinions upon the material found. Its work was illustrated. Previous to this time (in the early eighties) archaeologic work in the Central States consisted of meagre surveys, careless explorations, and the *careful* display in museums of *pretty* and *perfect* specimens. Broken or unfinished objects, or village site material was not preserved.

While these two societies carried on work in a new field, hampered by lack of means, the Missouri Historical Society did what it could in the way of publication and preservation of implements and skeletons in the neighborhood of St. Louis. Contrast the number of institutions engaged in this work today, with those of twenty years ago! In the east but five museums have been founded in the past twenty years which devote the greater part of their attention to archaeology. In the Central States there are seven which devote a large portion of their income for archaeologic work and four in process of erection. (This enumeration does not include the new library building given by Mr. Carnegie to Pittsburgh, a portion of which is to be

set aside for archaeology.) Those which have been organized within two years are: The Field Columbian Museum at Chicago; Walker Museum, University of Chicago; Orton Hall, Ohio State University, Columbus; Chicago Academy of Sciences Museum. Those a little older are The Cincinnati Art Museum; The St. Louis Academy of Sciences' Museum; The University of Michigan Museum. The University of Minnesota, according to dispatches, will soon have a museum largely devoted to archaeology, etc. The most progressive of these one would naturally expect to find in Chicago. However, the Cincinnati Art Museum has gathered into its magnificent structure several hundred thousand objects of archaeological value. The St. Louis Academy of Sciences expects to cooperate with its Historical Society and carry on extensive work throughout the Central Mississippi Valley.

A few years will suffice to give the west more and better equipped scientific institutions. She is now able to rival any or all of the eastern museums except that queen of American scientific institutions, the Smithsonian and National Museum.

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## COLLECTOR'S DEPARTMENT.

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### Progress of Field Work.

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DEPARTMENT OF ARCHEOLOGY AND  
PALEONTOLOGY OF THE UNIVERSITY  
OF PENNSYLVANIA.

Examining the position of objects in ancient strata, the association of human remains with animal bones in caves, and the arrangement of layers at Indian village sites, the summer's research has sought to learn, inde-

pendently of other observations, whether Man existed at Trenton seven thousand years ago, whether, if so, he was a stone chipper who could not polish stone (Paleolithic Man) or a stone chipper who could also polish stone (Neolithic Man) and whether, having survived the melting of the Great Glacier, he remained in the valley to change by slow degrees into the Indian or departed thence to work out his development elsewhere. The evidence of newly discovered blade quarries has been gone over with care and the story of village sites reviewed in the effort to learn how long the Lenape who met Campanius in 1643 had been here, whether coming, as he alleges, about 1390, he encountered a predecessor, or whether the valley discovered by him at that time had been for milleniums unvisited by Man.

Two to five men working twenty days at and near the ancient argillite mines on Gaddis Run, while definitely connecting the quarries with the modern Indian, discovered an apparently earlier type of Indian at an underplaced village layer close by. At the same time light was thrown upon that world-wide token of Man's earliest presence, the "Turtleback," for here were distinguished two classes of the much discussed stones, "Turtlebacks" of the quarry, (unlike the average Trenton specimens,) explainable as inchoate cache blades of the latest Indian period, and "Turtlebacks" of the riverside, (like the Trenton specimens,) not explainable as inchoate cache blades, and seeming to be token a period of unknown duration before the working of the quarries. (See the account in full of the work herewith sent.)

The discovery, on June 23, of another argillite quarry on Neshaminy Creek, (see Science for Oct. 9, 1893,) prepared the way for still further elu-

cidation of the purpose and bearing upon Man's early history of these leaf shaped stones which still puzzle and vex the searcher.

Turning to the chance of a sudden answer to discussed questions in ancient layers, the Trenton gravel cuts were twice re-examined, and as no careful record had been preserved of the position and association of the bones found in the only two caves of importance known in the Delaware Valley, both these abodes of former men and animals were re-explored.

Three men working a week in shafts sunk at various depths in the blasted area at Durham Cave in hopes of finding original cave floors, proved that too much rubbish had fallen in the destruction of the cavern roof by the Durham iron company to surely repay search, while the record of the chief remaining side gallery, known as Queen Esther's chamber, was saved by completely removing the floor humus—which contained, besides traces of fire, the bones, often gnawed by animals, of twenty species of vertebrata, (kindly identified by Professor Cope.) Besides the extinct Peccary, (*Dicotyles Pennsylvanicus*.) previously found in Hartman's Cave, (Pa. Geol. Rept., 1887, p. 8.) and whose remains are yet to be carefully associated with the surrounding facts, the Catfish, Chub, Frog, Snake (undetermined.) Rattlesnake, Bird (undetermined.) Bat, Porcupine, Marmot, Wood Mouse, Small Rabbit, Large Rabbit, Black Bear, Wolf, Fox, Raccoon, Otter and Deer had wandered into the recess to die, or had been carried thither as food by carnivora and men.

While the Durham Cave, lying close upon the river and south of the glacial moraine, had not probably been overwhelmed by ice, Hartman's Cave, on a hill-top near Stroudsburg, five miles from the Delaware and several

miles north of the moraine, must have been long buried under the Glacier. This fact, marking a clear epoch in the cave's history, had its important bearing on the fossil remains of the Bison, Peccary, and Giant Chinchilla (*Castoroides Ohioensis*.) found there, with human implements in 1880, for no man or large animal could have lived at the spot when it was overlaid with ice.

Information kindly furnished by the discoverer of the fossils and only previous explorer of the cave, Mr. T. Duncan Peret, showed that it was still half full of a clay deposit whose bottom had never been reached, and that, as no sure association had been marked between the bones and human remains previously found, we were justified in an attempt to recover, if possible, the story of the original relative position of layers and remains.

A trench 22 feet 3 inches by 3 feet 8 inches by 14 feet 1 inch reached the cave floor and proved, together with our further discoveries of bones, that all the fossils formerly found had come from a layer of debris lying above the clay, and when near the top of this we found a stratum of human habitation containing chert chips, arrowheads, charcoal, a pebble hammer and a charred bone, the notion of a Pre-Indian Cave Man, as suggested by the implements of bone first found, vanished, and we were confronted again with the Red Man as the contemporary, it seemed, of the Peccary and Giant Chinchilla.

H. C. MERCER.

Oct. 27, 1893.

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Recent discoveries and observations in Tennessee and Texas were made after the above report was issued. According to the Philadelphia Ledger of Jan. 8th, Mr. H. C. Mercer visited the

chalk bluffs of the San Diego river (Dural county) Texas. At the cliffs mammoth tusks and bones were found. But the rumor that flint chips were associated with these extinct remains was not confirmed. Indian remains had fallen down from the loam surface of the bluff tops, and had mingled with the bones of extinct species in the talus.

Important discoveries were made in the Lookout and Nickajack caves, near Knoxville, Tenn. Here, in the undisturbed mass of human and animal refuse on the floors of the caves, there was no question of the association, as the bones in the museum have been positively identified by Professor E. D. Cope, the eminent paleontologist of the University. Man had there lived with the deer, tortoise, elk, rabbit, raccoon, soft-shelled turtle, opossum, spade-footed toad, wild cat, wild turkey, squirrel and otter, for he had generally killed and eaten these creatures, whose remains, very rarely gnawed by animals, lay scattered above and below his fireplaces. The most important discovery was that of bones of the extinct peccary, found also at Hartman's cave, and of two teeth of the tapir (*Tapirus Americanus*).

### Information for Collectors.

(Continued.)

Large and small relic collections are sold every year. Generally the more extensive collections find their way into permanent museums in America or abroad. The unimportant ones are usually split up and scattered unto the four winds of Heaven,—although occasionally one finds its way into the hands of a private collector who adds it to his own and ultimately sells or donates his cabinet to some institution. As near as I can ascertain, in

the past ten years, one hundred and five collections have been sold. Eleven of these were forever dispersed by auction sales. Twenty-nine were sold to dealers and were consequently lost to science. Thirty are held by collectors of means who will probably place them where future preservation will be assured, and thirty-five went to museums. Thus it will be seen that 33½ per cent are already saved,—and that at least 20 per cent (of the wealthy and intelligent collectors holdings) will be preserved at some future time. There are about seven hundred fair sized collections at present in the hands of individuals in the United States. This enumeration does not take into account persons who possess less than fifteen hundred specimens. Assuming that the same proportion of objects will be preserved in the future as have been in the past, we can safely count on 53½ per cent of the present holdings ultimately finding way into museums.

I have collected the above statistics with great care. They are the result of observations among collectors covering a period of nine years and while there may be a few numbers one way or the other "off color," in the main they will be found accurate. Now let us look at the number of objects in museums. In 1893 the number held by the eighty-eight (large or small) Archæologic museums of the United States and Canada, ranged from 11,000,000 to 12,000,000. Of course over 60 per cent of these specimens are flint implements, broken pottery and bones; 40 per cent may safely be considered as consisting of good material. The number held by collectors, farmers and students cannot be estimated, even approximately. But I would venture the opinion that it greatly exceeded that exhibited by the museums, although, perhaps, inferior in quality.



The object which I have in setting forth the above statistics is two-fold. First, I would call attention to the enormous mass of "surface found" archaeological material in the United States. Second, to the importance of keeping local collections together, as a whole. No museum needs more single specimens, or "pretty" and perfect relics or objects just to show" art forms. The museums are full of axes, celts, pipes, banner stones, discoidals, hematites, tubes, slate ornaments and ceremonials, pestles, hammers, etc. What the museums need (as of great value to Archaeologic Science) are collections from a single locality including *everything* found in that locality. They want the finds of the villages site, the studies in unfinished specimens, the poor and the good, the imperfect as well as the perfect. In this regard the collectors make a great error. Most of them do not save *everything* but cling to the "pretty relics" and discard the rough and the rude. Personally, I would give more for a collection, provided it contained *all* the types, *all* the finds of a certain valley than for just the fine, perfect objects of that valley. From a collection of the latter I would be misled, for, if I accepted it as indicative of the status of culture of the people of that valley, I would say that they made most beautiful works of aboriginal art, nothing rude or unfinished being turned out by their artisans. In such a statement I would be unpardonably wrong.

Because museums and collectors have so many million surface, scattered or unrecorded finds there are many collections on sale today. I can name forty collections averaging six thousand specimens, which cost from \$2,000 to \$10,000 each and can be bought for \$700 on the average. In Board of Trade language "the market is *full*," no one is *short*, all are *long* on relics!

There is a good demand for scientific exhibits, but who has one for sale? Where is a collector in the United States who offers a strictly high class cabinet? They have all gone astray after the "pretty relics." Those who had good local collections have long ago sold out. The proof of the pudding is in the eating thereof. Consequently, if art forms bring no price, why do not collectors confine their cabinets to the locality wherein they reside? (I speak of collecting now from a financial standpoint.) It is much more convenient to collect from one's country. Why do you gather from all over the country?

As a summary of the above, I would beg of collectors to save *all* finds and not discriminate.

Concerning the sale and purchase of specimens there is much to be said. When a man, who has long been a collector, is in financial straits, he must sell out whether to a dealer or an institution. The latter is slow to purchase, but it invariably pays more than the former. I would advise him to try the institutions first, then individuals and lastly the dealer. I have nothing against the dealers, it is only because I regret to see collections broken up that I place them last on the list. A man should avoid, if possible, the sale of his collection. He should not split it up, particularly if it is local. If he has bought it of Tom, Dick and Harry there is little difference what he does with it.

*Never split complete finds.* I mean by complete finds a cache of leaf-shaped implements, or a mound find. Under no circumstances break it up. The laws in such instances are as inexorable as the rules governing a whist player. What damage has been done by the scattering of a series of beautiful flint implements, or the separating of a skeleton from its copper, its pipes, its orna-

ments, its beads! In my previous paper I begged collectors not to attempt explorations. Not only do I reiterate my former statement, but in addition beg that the results of field work be forever kept with proper record. If they must be sold, give the option to some museum or wealthy collector. For Heaven's sake don't scatter them.

We talk of the little known regarding the pre-Columbian natives of America and we blame early investigators for carelessness and because they failed to record in detail their observations. But with due allowance for short comings, the early students were angels compared with the vandals found in the ranks of collectors. When in Ross county, at Hopewell's group, it made my heart sick to see nearly every week a string of beads, a skull or some ornament brought in by an ignoramus who had dug it up and now desired to sell it. Every survey stirs up interest among the country collectors. They attempt exploration on their own accounts and destroy in a few days more than a well appointed survey can preserve. In this they are not alone guilty, for the city collector of means offers cash for the finds and encourages the work of destruction.

It might be asked, if all the above is condemned, what is permissible? The sale of a whole collection, or a part of it, so long as complete finds are not split is always proper. Single specimens, bought of dealers, may be sold with a free conscience. Also complete finds. What is really wrong is the destruction of scientific testimony.

As to the purchase of relics. The old collector *knows* what he needs. I shall not attempt to suggest to him. The beginner may desire slate ornaments, pipes or spear-heads. It would be much better if he would take the twenty dollars he would expend and

buy a small typical collection, illustrating the life and arts of one tribe—found in a limited area. If the reader will pardon a personal illustration, I will endeavor to "cinch" my point. Many years ago when I began collecting I paid \$2,500 to three well known dealers for a large lot of beautiful specimens. For a long time I highly prized them. But when several institutions contemplated the purchase of my collection, did they regard those "pretty relics" as highly as I did? Not much! They offered more for my complete sets, my field finds and entire local collections. The fine objects from all parts of the Mississippi Valley were of little value to them. Every large collection put up for sale would be judged just as mine was.

Every few years a great cry is raised about counterfeit relics. It stands as the old cry of "Wolf! Wolf!" did. In Missouri, during '76 to '83, considerable pottery was manufactured to satisfy a large demand. At the same time in Philadelphia and Southern Indiana (near Cincinnati) relics were made. Of late years in Western Pennsylvania and at Wyman, Mich., singular specimens have been set afloat. Only the ignorant are caught. The old collectors know the frauds, and, besides, it would take a man such a long time to make a valuable relic and the price would be so low that it would not pay to enter into the business. With eight exceptions, relic dealers are broken down; men who have failed in every thing else. The business does not pay even where one carries it on extensively and steers clear of all suspicious specimens. I challenge any one to point out a single dealer who has made even a small fortune out of it.

With regard to exchange, little need be said. It is very beneficial where properly carried out. But usually some one wants to trade his poorest and

most worthless objects for something of value. It is like horse trading—it savors of rascality. If exchangers traded complete finds, whether of poor or good material, benefits might accrue but usually some beginner “does” another beginner.

However, among collectors there are often valuable exchanges. If the readers of *The Archaeologist* would avail themselves of our exchange department, I am confident that each one engaged in a trade would meet with satisfactory results.

#### HOW TO ENLARGE A COLLECTION AT SMALL EXPENSE.

Instead of exchanging, purchasing or wasting time in small correspondence, select through the columns of *The Archaeologist* a half dozen or more responsible, well known collectors. Arrange with them for an exchange of one-third of your collection for one-third of theirs. For instance, suppose that you have 3,000 specimens in your cabinet. Select from that number 1,000 which shall fairly show the arts, daily life and burial customs of the tribes inhabiting the region in which you made your collection. Write to the references given by your correspondent and ascertain if he is a man of good standing in his community. If so, submit to him a detailed proposition setting forth what you have and what you desire. Accompany your communication by photographs, if possible, otherwise send on drawings, which you are to execute to the best of your ability. Give him both good and poor, finished and unfinished specimens. Have it understood that he is to furnish you similar objects. Do not send him all your poor and worthless specimens, trusting to get the better of him in the exchange. If this be carefully followed out you will still have a representative collection from your locality

—which will be of great scientific and commercial value—and at the same time you will have a collection which shall illustrate the historic people's of the region wherein your correspondent lives. In the course of one or two years, by judicious collecting in your own vicinity, and purchase of farmers, store-keepers and small collectors, you will amass a sufficient number of specimens to make several such exchanges. By such means one would soon have a collection which would cover a number of states and be of great value. Suppose the collector lived in Missouri—he would desire to represent the whole of the Mississippi Valley besides his own state. If he had collected for five or six years his cabinet would probably illustrate the lives of the people who once occupied the region near his home. He could easily spare one-third of that collection. Let him exchange with some one living in Southern Illinois. His next exchange would be with some one living in Mississippi, Minnesota or Ohio. Thus in five or six years he would have fifteen or twenty thousand specimens which would practically cover the Mississippi Valley. It would not break the value of his cabinet. One or two thousand specimens are amply sufficient to illustrate any given locality. When one has more than that number, let him select from his cabinet and exchange. If possible he should avoid sale. There appears each month in this magazine the advertisements of a great many dealers, yet I doubt if any of them, no matter how extensive, receives an income from archaeological trade equal to that of the ordinary second class clerk. If the following suggestions are followed out by the collectors in possession of larger cabinets, I am confident that much good will be accomplished and that the science of pre-historic anthropology will be advanced.

Each collector knows his region thoroughly and he should use that knowledge both to aid other collectors and in giving institutions information regarding village sites, mounds and enclosures. It is only by co-operation on the part of both collectors and the scientists that we will arrive at anything like a comprehensive knowledge of the pre-Columbian occupation of America.

The editor of the Collector's Department will be glad to enter into correspondence upon any of the matters set forth in the fore-going pages. Next month we will take up the question concerning usages and names of various implements, ornaments and utensils.

*(To be continued.)*

### The Field Columbian Museum.

To anyone entering the Fine Arts Building (now the Field Columbian Museum) a scene of excessive activity presents itself. There are halls and rooms of boxes, cases, furniture and specimens. A small army of men is engaged in reducing chaos to order. One can see but little of interest at the present writing (the 20th of January). It will take several months to place the many thousand exhibits in proper shape and select the good from the bad. Much worthless material has been accepted, but that was unavoidable as donations could not be refused without hurting the feelings of persons who believed they were doing the museum a service.

No one has been appointed as Chief of Archaeology and Ethnology. Dr. Franz Boas is serving temporarily, and it may be that he will be permanently appointed. Quite a number of interested gentlemen desired that one of the Washington men should occupy the place. There are three men in Washington who are more competent to

manage a great museum than any other aspirants to the position. We have it on the authority of inside information that Mr. G. A. Dorsey, (who has written upon Peruvian archaeology for The Archaeologist) will be first assistant. He is now at Harvard completing his course for the Ph. D. degree, and will be ready to come to Chicago, July 1. No field work will be attempted by the museum before next summer.

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### CORRESPONDENCE.

ED. ARCHÆOLOGIST:

In connection with the article by Dr. Snyder in the December issue, concerning the "llama" pipe, it may be of interest to your readers to know that C. T. Wiltheiss, of Piqua, Ohio, found in a stone grave near that town (the county seat of Miami county) a small, irregularly-shaped, flat piece of *jade* polished over its entire surface, and drilled near one end for suspension as a bead or similar ornament.

GERARD FOWKE,

CHILLICOTHE, O., Dec. 28, 1893.

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Mr. O. P. Helton, of Shelbyville, Ill., in an open letter to The Archaeologist makes a good point concerning Paleolithic Man. It seems to the editor, that the gentleman asks a question which may puzzle those strong in Paleolithic faith. He says:

"It is well to remember that the ice sheet only covered something like the northern half of the United States. What known conditions existed to prevent primitive men from retreating before the glacial invasion to the southern half of the United States and there remaining?"

He also advises collectors and students to confine search to high ground, railroad or pike cuts, wells and excavations. That the rivers and streams



have so mixed the glacial with the flood deposits of recent times that specimens are unreliable.

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### Indian Graves.

The writer in company with Ed. Handley, and John and Will Eiche, explored an Indian grave on Walnut creek about five miles south of the city of Atchison not long since. The grave was located on a beautiful knoll in the midst of the timber in the creek bottom. At a depth of about four feet a human skeleton was found lying in a prostrate position with the head to the west. The different bones were in a good state of preservation, and the skull was supplied with a perfect set of teeth. With the skeleton were found small bits of decayed cloth together with a large number of small ornaments resembling tiny sleigh bells which produce a jingling sound when shaken. These had evidently been attached to the garments of the deceased. A common china plate, ornamented around the edge was placed over the breast of the dead Indian. The signification of this I have not been able to decipher, but the probability is that it points to a superstitious custom with the tribe to which the deceased belonged. It was a custom among certain tribes to place with their dead a certain amount of food for the benefit of the departed on his long journey to the happy hunting grounds. Such may have been the case in this instance, and the plate may have served as a receptacle for the food. It is evident that the remains had been placed in a hewn log as large pieces of decayed wood, to which the bark was still clinging, were found all around the edges of the vault. Everything goes to show that this was the grave of a modern Indian, and the objects found therein

would indicate that the deceased had been in mutual contact with the whites. To what tribe this Indian belonged I am unable to say. It may have been the Kickapoos who had a village further down the river, or else some wandering tribe.

On a high ridge a few rods west of this grave is an Indian burial ground, but whether they correspond with this grave I am not prepared to say as none of them have been explored. These graves are covered with limestone which was carried from a ledge near by. GEORGE J. REMSBURG.

ATCHISON, KAN.

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### BOOK REVIEWS.

The Speech of Monkeys, by R. L. Garner, New York, '92, (75c.) Charles L. Webster & Co.

In this work Mr. Garner treats of matters of great interest to the evolutionist. He touches upon an entirely new subject and his observations will be of value to science. It cannot be said that he has proved that which the title of his book would indicate. But he has at least opened the gate to a new field of investigation, and he should be given all credit.

The nature of his observations in Africa have not been set forth in this volume. Judging from the evidence submitted (and it lacks in quantity) the intelligence of the Simian family is really very remarkable. It is possible that sounds are employed to communicate ideas, but Mr. Garner has not attempted to give us a vocabulary. In some of his observations he has not recorded sufficient details. While many of the sounds could not be made familiar to the reader by means of the alphabet he should have given such as could be reproduced. Chapter V of Part II. of his work in the most im-

portant section of the volume. We quote some of his most positive statements.

"The sounds which monkeys make are voluntary, deliberate and articulate. They are always addressed to some certain individual with the evident purpose of having them understood. The monkey indicates by his own acts and the manner of delivery that he is conscious of the meaning which he desired to convey through the medium of the sounds. They wait for and expect an answer and if they do not receive one frequently repeat the sounds." \* \* \* "The same sound is interpreted to mean the same thing and obeyed in the same manner by different monkeys of the same species. Different sounds are accompanied by different gestures and produce different results under the same conditions. They make their sounds with the vocal organs and modulate them with the teeth, tongue and lips, in the same manner that man controls his vocal sounds. The fundamental sounds appear to be pure vowels, but faint traces of consonants are found in many words, especially those of low pitch, and since I have been able to develop certain consonant sounds from a vowel basis, the conclusion forces itself upon me that the consonant elements of human speech are developed from a vowel basis."

We would recommend the book to all students of anthropology.

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Maize, a botanical and economic study,  
by John W. Harshberger, Ph. D.,  
University of Pennsylvania (\$1.50.)

We have seen but few archaeological studies which equal this splendid monograph. Dr. Harshberger has compiled all that has been written in French, German, Spanish and English regarding Maize. To this he has added reports of exploration among pre-historic ruins, mounds, graves and

cases where corn has been found. The volume shows pains taking research and gives to the student in proper form a great mass of testimony which he could not possibly collect inside of three months—matter which would be unavailable unless he understood the European Languages.

It opens with an analysis of the plant upon botanical lines. Next he takes up archaeological proofs and refers to sculptures of the plant in Yucatan, Mexico, and of the ears upon Peruvian pottery. He also speaks of large quantities of corn found in the pre-historic cemetery at Madisonville, O. In concluding his Sec. C., archaeological proofs, he states: "We conclude that from the archaeological data it seems very likely that Maize originated north of the Isthmus of Tehuantepec and was carried south by barter or trade."

Under Sec. D. (ethnological proofs) he states that the Mound Builders were the Alligeni referred to in ancient traditions of Algonquins and that these people used Maize giving same to northern and eastern Indians. The only point which any one who has carried on extensive explorations in the Ohio Valley would dispute is his statement regarding the bison. He contends that the bison was not in Ohio before 1000 A. D. Bison bones were found (a complete skeleton) in one of the mounds near Flint Ridge, Licking county, O. The flint quarries are conceded to be very ancient and were worked long before the historic period. Material from the ridge accompanied the skeleton.

Corn of the southwest seems to have been very small, judging from the ears and grains found in the cliff houses. The natives did not know how to improve it by cultivation and used no care in selecting seed.

Under Sec. E. (philosophical proofs)

he gives a large vocabulary of names for Indian Maize and notes a similarity. One singular method of fertilizing corn was in vogue among the Indians of 1600. They would dig a small hole with a rude hoe made of wood, bone or muscle shell fastened to a short stick. Several grains of corn and one fish were dropped in the hole and covered up. The fish formed a good fertilizer. In this connection it is interesting to note thousands of notched muscle shells found in village sites in Ohio. The edges of these are invariably worn. We have always considered them hoes, and Dr. Harshberger's account confirms the opinion.

The work closes with some references to the utility of Maize, the quantities consumed in the world, etc. We shall quote a paragraph of special interest to the readers of *The Archaeologist*: "This brief ethnological survey of the North and South American tribes is useful in showing the comparative age and cultural position of the agricultural races of Indians. That the Mayas were the superiors of any other race on the North or South American continent and were the source of a large part of the indigenous American culture is proved; (1) by the fact that the tribes and Mound Builders in the present territory of the United States were just entering on the agricultural state; (2) because the Pueblos built structures of scarcely higher order than the Cliff Dwellers, who were driven by the invasion of wilder tribes to build in the mountain fastnesses instead of living on the plains in round or rectangular huts of stone and mud; (3) because the Nahnas evidently borrowed their agriculture from the more advanced Maya tribes in the south, with whom they came in contact in their settlements and migrations; (4) because the Incas occupying a northern location at first near

the great Panama trade route, at a later date spread their sway to the far south, carrying the germs of agriculture and the rudiments of the arts to the barbarous tribes in the Bolivian and Chilean highlands, and this argues for a comparatively recent development of their civilization and agriculture for in Mexico all the tribes practiced agriculture, but in South America, among the wild tribes, agriculture was yet in its insipient stage."

Every page contains numerous references to publications. The book is the work of a scholar, of an anthropologist and deserves to occupy a high place in scientific literature.

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## NOTES AND NEWS.

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In the *Detroit Free Press* of Nov. 12, 1893, Mr. H. I. Smith contributes a valuable article entitled "Anthropology at the University of Michigan." In the course of remarks concerning the importance of the new science in the University he says, "Anthropology, instead of being another burden to the list of studies of the student, is, on the contrary, a help. All his other studies are made more easy by understanding their origin, history and the relation which they must have to the welfare of man. Besides this, anthropological study tends to develop a liberality of thought and a strong respect for the customs, government and religion of other races."

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Two Akka girls who were rescued from Arab capturers by Dr. Stuhlman and his companions have been brought to Europe, and will remain in Germany for some months. In the summer they will be taken back to Africa, where they will be placed in some mission house, or otherwise provided for. They are supposed to be

between seventeen and twenty years of age. A correspondent of the London Daily News, who saw them at Naples, Italy, says they are well proportioned, and as tall as a boy of eight years of age. Their behavior is "infantile, wild and shy, but without timidity." One of them was always cross, bending her head, and glaring from beneath frowning brows, while the other often laughed joyously, was pleased with bead bracelets and other trinkets given to her, and expressed by a queer sniff of her flat nose her appreciation of some chocolate bonbons. After making "a capital dinner on rice and meat" they greatly enjoyed the sunshine in a pretty garden, where they gradually grew more confident, and finally allowed themselves to be photographed arm in arm with the little son of their hostess." "The coquettish one shook with laughter, and seemed to guess that a process was going on flattering to her vanity, while the cross one still looked gloomy and suspicious. They showed neither wonder nor admiration of the people and things around them in the artistically furnished house and tasteful garden. Their eyes, though large and lustrous, have less expression than the eyes of a monkey." These interesting representatives of one of the pigmy races of the world are to be presented to various scientific societies in Berlin.—Scientific American.

### The Evil Effect of Civilization Upon the Eyes of Indians.

Dr. Carlos Montezuma, the government physician of the Indian school at Carlisle, has brought to Philadelphia thirty Indian children of both sexes for eye treatment at the Medico-Chirurgical hospital. The cases are of great interest in optical study, as they show just what effect civilization has

upon the eyes of the redskin, who is accustomed to prairie life with all its freedom of action, says the Press.

The disease with which the eyes of the little band is afflicted is inflamed eyelids. The smoky tepees largely cause this trouble and when brought east the contagion spread throughout the school. It often runs into granular lids with a tendency to destroy the eyesight. Sometimes ulcers of the cornea get so bad that the eye shrinks away and the eyeball has to be removed. But the cases of the children just brought on were not so severe, with the exception of one boy who will possibly lose one of his eyes.

Upon examination it was found that the Indian boy and girl have one-tenth more vision than a white child. They are what might be called "far-sighted." Their eyes are adjusted to discern objects at great distances. Consequently when they are brought east and placed in schools there is a complete change in visual objects. What they see is near at hand. They become subject to headaches, due to the great strain caused; disease follows.

An interesting feature has been brought out in the tests for color blindness. It has been found that the Indian has an extremely low average of color defects. Color blindness in an Indian is very rare. About twenty of the thirty children had their eyes tested for glasses, which they will only use when reading or studying.

Dr. Montezuma, who brought the children here, is an Indian himself and has had a romantic career. He is of the Apache tribe, his father being one of the bravest of these fierce warriors. When five years old he was carried away captive by the Pruisé Indians, who had made war on the Apaches, and later was sold to a landscape photographer, who took him to Illinois and sent him to the State University and later to the Chicago Medical college.

Note—The cuts in Vol. II, No. 1, pages 29 and 30, are one-half natural size.



# The Archæologist.

VOL. II.

WATERLOO, INDIANA, MARCH, 1894.

NO. 3.

## VESTIGES OF EARLY MAN IN MINNESOTA.

[BY W. H. HOLMES, WASHINGTON, D. C.]



OF the various sites reputed to have furnished evidence of the presence of glacial man in America, Trenton, N. J., has always taken precedence and is still the focal point of interest to students of the question. Next in importance, so far as the literature of the subject indicates, is the site at Little Falls, Minn. Attention had been called to the Minnesota site however, before Trenton came into notice, by Prof. N. H. Winchell, state geologist of Minnesota, to whom belongs the credit of the discovery of relics of human handicraft in Little Falls as well as the credit of accurate and complete observation of the occurrence of objects of flaked quartz in the superficial glacial deposits.

As far back as 1877 he noticed the occurrence of mounds and camp sites with various relics on the site now occupied by Little Falls. He also found that quartz chips and rudely worked pieces were distributed to a depth of three or four feet in the surface stratum of glacial sand.

My own observations confirm, in every respect, those of Prof. Winchell, but the examination of other groups of related phenomena makes it necessary to revise his inferences and conclusions. Finding relics of art deeply imbedded in the deposits capping the terrace, he inferred that the site was occupied by men during the closing episodes of the glacial period and coupling this idea with the fact that the shaped relics were all extremely rude he further inferred that the culture of that time must have been paleolithic. My investigations have shown, however, that the flaked quartzes were probably not originally included in the loam, but rather that they were introduced into it in post-glacial times, and that they were rude because mere shop refuse, the period of occupation thus, in all probability, corresponding to that of our historic aborigines. In these views Prof. Winchell now fully acquiesces.

Several years later Miss Babbitt engaged in investigations of this place. Finding numerous flaked quartzes outcropping along the terrace front near the base, she assumed that the deposit was interbedded with the gravels at this level and inferred that man must have occupied the site early in the gravel forming epoch. Being unable to explain the fact that the flaked objects were all of rude types without supposing an exclusively rude state of art,

she was led to assign them to a paleolithic culture. My researches make it plain, however, that the original observations were vitally defective and that the inferences and conclusions are wholly unsupported.

Prof. Winchell revisited Little Falls at the period of Miss Babbitt's later investigations and accompanied her to the site of her finds. He did not attempt, however, on this occasion to do more than examine the surface phenomena at the "notch" and, although not fully satisfied with the deductions of Miss Babbitt, did not enter into the further discussion of the subject.

In returning from the copper mines of Isle Royale in June, 1892, I paid a visit to Little Falls, and had the great good fortune to be joined by Prof. Winchell, who identified for me the site of his original discoveries as well as that of the subsequent investigations of Miss Babbitt.

Before describing my work at the latter point I will sketch briefly the general archæologic features of the vicinity presenting the results of such observations as bear directly upon the questions of the age and character of the flaked quartzes. The Mississippi river in this part of its course flows in a somewhat sinuous channel cut to a depth of from 20 to 40 feet through a glacial terrace. Until a few years ago the river descended in a succession of rapids through the site now occupied by Little Falls village. A dam twenty feet in height was built across the lower end of the rapid in 1888, and this has backed the water up for a considerable distance, drowning the banks to depths decreasing gradually with the distance from the dam. The main terrace has a rather even surface which rises from ten to twenty feet above the level of the back water. A limited bench, a post-glacial flood plain, on the west side, is several feet lower. The place affords an ideal site for settlement either by savage or civilized communities. The occupation of the terraces adjoining the rapids by our historic aborigines was natural and inevitable, and I began at once to seek evidence of their presence, hoping readily to secure material for a comparison of their arts and industries with the reputed works of the ice age. Village sites were easily found on the terraces adjoining the lower end of the former cascades, one on the east side occurring on the remnant of a subordinate bench at the end of the dam and another on the west side three or four hundred yards farther down.

The western village was located on the post-glacial flood plain and was manifestly recent, the site being covered with clusters of fire-marked stones—boiling or hearth stones—and with flaked quartz-refuse and hammerstones of ordinary types. The entire surface was grassed over and observations could not be readily made save on the banks of the river and in gullies cut by mill-race overflows. On the surface of the terrace, perhaps one hundred and fifty yards below the west abutment of the dam, a wagon trail had cut the sod, exposing a nest of quartz fragments, which I dug out, finding them to be the usual quartz shop refuse consisting of flakes, partly shaped rejects and angular masses. The cluster was some three or four feet in horizontal extent and two or three inches deep in the middle, thinning out at the margins. It had not been seriously disturbed since left by the arrow-maker, save, perhaps, that such large pieces of stone as projected above the sod had been removed. In the side of a deep wash just below the lower mill and between three and 400 yards below the dam, the section of a similar shop cluster was exposed. There was visible in the vertical bank only a band of white chips, two or

three inches deep in the middle and thinning out at the edges as in the other case, the deposit being covered by an inch or two of soil. Working this material out carefully with a hand pick, I secured about a peck of the ordinary quartz refuse and two pitted stones; the latter were found near what was originally the middle of the shop, just as left by the artisan who did the work. The essential observation in regard to the latter, as well as to the clusters of splintered quartz, is that all are evidently of modern aboriginal origin.

On a somewhat higher level, about half a mile above the dam, near a large lumber mill, I found another shop cluster of like character, the fragments being distributed to somewhat greater depth through disturbance of the original bed. Near by was a small artificially discoid hammerstone of granite.

These shop clusters all contain the ordinary flakes, fragments and rejects of blade-making characteristic of quartz shop-refuse in all parts of the country. The ground on the west side of the river, wherever disturbed by plow, pick or wheel, is found to contain more or less quartz fragments of corresponding forms. It was apparent that the supply of raw material was easily and generally accessible, and I soon found that over a large part of the secondary flood plain the alluvial deposits are very shallow, being underlain by Huronian slates through which run numerous heavy veins of quartz. A trench from two to four feet deep carried along a newly laid railroad track, a few rods back from the river, exposed many of these veins and white workable masses of quartz were scattered about in profusion. These ancient formations rise considerably above the present level of the back-water and certainly reach to within eight or ten feet of the surface level of the main glacial terrace. This fact, it seems had not been previously observed. The only well marked village site found on the east side of the river is located on the remnant of a subordinate terrace which connects with the abutment of the great dam. The terrace is from three to six feet above the water of the dam, and falls off abruptly below some twenty feet to a lower level. Originally there was here on this camp site a slight convexity of the surface, the result, no doubt, of building up of kitchen-midden material. The remnant of this accumulation is occupied by a blacksmith shop and could not be thoroughly examined. A section exposed by recent repairs to the dam shows about eighteen inches of dark soil filled with quartz fragments, charcoal and decayed refuse, resting upon stratified gravels. The latter are apparently only a few feet deep and rest upon the quartz-vein-bearing slates, of which excellent outcrops are seen in the bank below. The main terrace lies about one hundred feet back and rises six or eight feet above the village-site level.

The location and character of this site would seem to show conclusively that it was occupied in comparatively recent times. Many of the quartz bits and masses are partially shaped as in other places where implements were made. No other works of art were found. Quartz veins are exposed in the banks and bed of the river below the dam and on Mill island opposite, and I am informed by Prof. Winchell that large and conspicuous outcrops of quartz-veins were to be seen, before the dam was built, in the slates forming the bed of the rapids above. Considerable quartz flaking was done at various points along the bank of the river for nearly a mile down.

On Oak street, two or three hundred feet northeast of the village-site midden, I found an interesting shop cluster. The street is sunk a few feet into

the level terrace exposing the surface deposits of sandy loam and making a section of the cluster of quartz shop-refuse; it was seen that this deposit did not lie in a horizontal bed just beneath the surface, as in the cases observed on the west side of the river, but that portions of it were disturbed, the fragments being distributed through the soil to a depth of a foot or more by some agency not clearly apparent. At other points near by I observed isolated and widely disseminated flakes projecting from the bank down to a foot or two beneath the surface. On the river bank three or four hundred feet farther north and near the foot of Elm street is the site of Prof. Winchell's original discovery of flaked quartzes distributed through the loam. This portion of the terrace, lying about the eastern entrance to the bridge has been much occupied by the aborigines and is strewn with flakes and fragments of quartz.

Further evidence of the modern occupation of the terraces about Little Falls is found in the presence of mounds and earthworks and in the discovery of arrow points of quartz and other ordinary Indian implements. From these varied observations it is plainly seen that this locality was extensively occupied by our historic tribes and the evidence is ample that they made free use of the quartz, outcropping at so many points, and that the refuse resulting from the manufacture of their implements is identical in every way with the relics obtained by Prof. Winchell and Miss Babbitt.

I paid my first visit to the site of Miss Babbitt's well known investigations in company with Prof. Winchell and Mr. W. W. Williams, of Little Falls, and the former identified and pointed out the exact spot on which the finds were made. So far as can now be seen the conformation of the ground is accurately described by Miss Babbitt, although since the period of her studies the river has been much altered by a dam, and at this point the water has been raised eight or ten feet. The chief change produced is the entire drowning of the lower flood plain, which, if I am correctly informed, extended from near the base of the bluff several hundred feet outward to the margin of the main channel. A little farther down the outer and higher portion of this plain is still visible during periods of low water and is known as Boom island. It is, or was, separated from the present shore—the main bluff face—by a shallow channel. The water now rises to within an average of about twelve feet of the summit of this bluff, washing the slope a little below the level of the supposed outcrop of artificial quartzes.

At this point a shallow water-way or wash, called the "notch" by Miss Babbitt, and formerly occupied as a wagon road, leads obliquely down the slope to the water's edge. Before the dam was built ferry boats landed at a lower level, and in aboriginal times this spot was no doubt the upper end of a portage by means of which the rapids were avoided. Save for this break the bluff is continuous for a long distance, rising in places at a steep angle, but having at this point a slope of perhaps twenty or twenty-five degrees; the old roadway has a more gentle inclination. The accompanying sketch map conveys a clear notion of the topography of the spot and indicates the nature and extent of my trenching operations.

It was observed that the sloping sides of the shallow roadway were somewhat freshly broken down exposing the black surface loam a few inches thick and portions of the yellowish sandy loam beneath. The former finds of flaked quartz were made mainly at x x, Fig. 1, just above where the water now



washes the northern bank of the roadway, and I found many specimens projecting from the soil at this point: but examination developed the fact, not observed by Miss Babbitt, that others were present, though more sparingly, in the dark loam on both sides of the roadway all the way up. I began a trench at the water's edge, as indicated by the heavy dotted lines, and carried it into the terrace, descending at intervals two or three feet below the

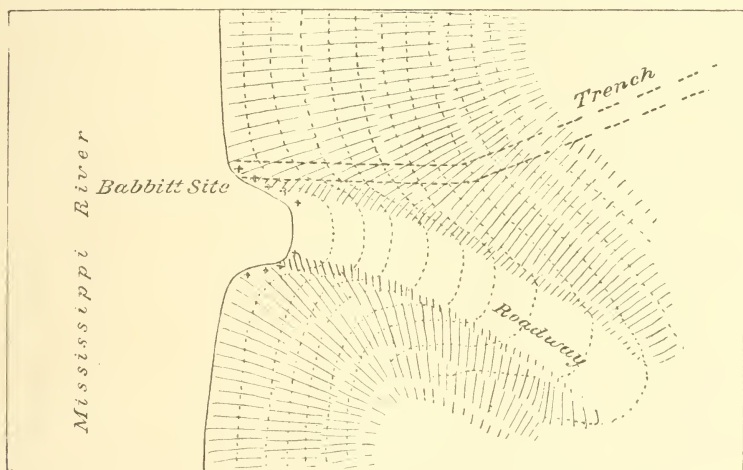


FIG. 1. Sketch map of the quartz shop described by Miss Babbitt. The heavier deposit of quartzes is at x x x. The heavy dotted lines indicate the position of my trench.

water level. On the submerged slope as far below the water level as it could be examined, the quartzes were apparently confined pretty much to the surface. The main deposit of shaped pieces, the Babbitt bed, rested upon a bed of nearly pure sand sloping gently upward from the water level.

As the trench advanced large numbers of the quartz fragments were encountered and it was observed that they corresponded closely in every way with those described and illustrated by Miss Babbitt and with those found upon and near the surface on the river banks below. There were in the deposit considerable masses of white quartz, just as they were derived from the veins, smaller fragments, bits, flakes and many partially shaped pieces evidently the rejects of blade-making. I had for three years been familiar with identical quartz shop-refuse. These articles were embedded in rather loose heterogeneous gravels and though confined to a pretty uniform level below, resting upon a bed of sand, they extended upward to the surface of the slope. They were distributed somewhat generally throughout the mass, although a slight appearance of clustering was at times noticeable. As we penetrated farther the fragments became less numerous and included fewer large pieces. Having advanced about twenty feet on a line nearly parallel with the north

bank of the roadway the formations began to change their appearance at the base and it soon became apparent that we had reached the limit of the heterogeneous quartz-bearing deposits, here some five feet deep, and were encoun-

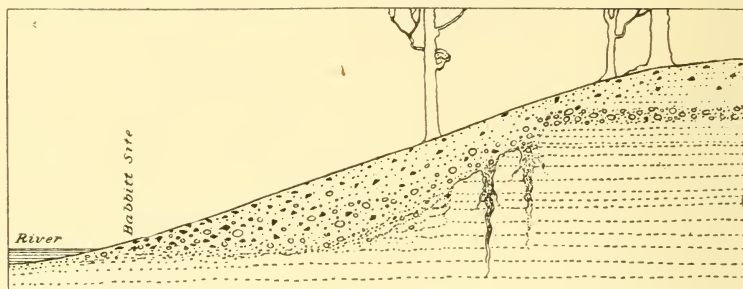


FIG. 2. General section of terrace margin, Babbitt site showing bedded gravels and quartz-bearing talus, the black angular figures representing the artificial material.

tering homogeneous undisturbed strata, the separation being, however, quite indefinite. There was a somewhat gradual change of color and composition; from dark heterogeneous materials there was a gradation through mottled, mixed materials to yellowish, homogeneous, gravelly sands. The surface or front of these sands, referred to usually as gravels, rose at a high angle, and at thirty feet advance in the trench the superficial quartz-containing deposit had, from five feet deep at the 22d foot, thinned out to eighteen inches. The section presented in Fig. 2. was drawn with great care and represents the general conditions with all necessary accuracy and without distortion of scale.

The phenomena of the front surface of the normal gravels as exposed in the trench were very instructive. There had been considerable disturbance by cracking and sinking, especially on the side next the bank of the roadway. In this disturbed portion a few bits of quartz were found, and to the unskilled observer these might have been considered original inclusions in the gravel; but Prof. Winchell was present and gave his opinion freely that they were there through disturbances indicated by the mixed coloration. A little further on, at about the 32d foot, we came upon the root of a tree, the tap root of an oak, still preserved up to the dark soil of the surface, here some twelve inches thick and extending down through the strata below the water level an observed depth of six or seven feet. Having partly rotted, the root was surrounded by blackish earth. Further on a similar root was encountered which had penetrated to like depth, but which was almost totally decayed. The space was filled with blackish sandy loam containing to some depths bits of gravel descended from the surface beds of heterogeneous materials.

In the normal deposits beyond these roots there was no trace of disturbance or of abnormal discoloration; neither was there a trace of flaked quartz.

although hours of patient search were expended upon the full exposure of the undisturbed deposits extending to a foot or more below the water level.

As indicated in Fig. 2, a layer of boulder-bearing gravel several inches thick, occurs at about five feet below the terrace surface. On the terrace slope at this level the surface loam, containing flaked quartz, was only a few inches thick; this condition is accounted for by the fact that the boulder gravel, being firmer than the sands above and below, resists erosion and tends to form an outcrop, the loose materials from above descending to lower levels. Upon the layer of gravel rests about five feet of light brownish sand or sandy loam, somewhat darker near the surface from the decay of vegetable matter. A line of pits was carried across the level terrace, in continuation of the trench, to test the nature and contents of this deposit. In every pit, for more than one hundred feet from the margin of the terrace, shaped quartzes were found and strangely enough they appeared to be somewhat uniformly distributed through the loam to the depth of from two to three and a half feet. This was a repetition of the interesting phenomena observed by Prof. Winchell one-half a mile below; but before taking up this division of the subject I shall look more fully into the main source of controversy, the Babbitt finds.

The results of my own observations of the phenomena of this site are clearly presented in the accompanying section. The glacial formations concerned consist of three members, first, beginning at the top, about five feet of sandy loam; second, a layer from six to twelve inches thick, of boulder-bearing gravel, and third, a deposit of rather homogeneous sand with some fine gravel, extending down to two or three feet below water level, an exposed thickness of about eight feet. The face of these deposits is rather steep and is hidden by accumulations formed of materials weathered from the projecting edges of the strata. The talus deposits are only a few inches thick on the upper part of the slope, but reach about five feet in thickness toward the base, as already shown, the terrace slope just here having an angle of from fifteen to twenty degrees. The whole of this talus deposit, from top to bottom, is filled with the refuse of quartz-arrow making, the heavier deposits of fragments occurring near the base, as shown in Fig. 2.

The geologic, topographic and ethnic story of this site, read in the simplest manner from carefully observed data is about as follows: The formations constituting the river terrace, as indicated above, were, at the close of the glacial epoch, in the main continuous across the valley. The post-glacial river cut its channel down through these deposits, reaching finally its present bed in the Huronian slates upon which the gravels were laid down. When the river flowed actively along the east side of the channel, washing the base of this bluff, the latter was no doubt much steeper than now and had a height of about twenty-five feet. The horizontal glacial deposits were exposed to their full thickness, and in all probability, relying upon observations made in the vicinity, the underlying quartz-bearing slates at the base were uncovered to the depth of from five to ten feet. When the river ceased to erode actively at this point, the loosely bedded gravels and sands forming the upper part of the bluff disintegrated and descended to the base, covering the slates and the exposed edges of formations and gradually producing the practically stable slope seen today.

The primitive inhabitants of the valley sought quartz wherever the veins were conveniently exposed. Finding at this point a natural descent to the river by a gully, now the old roadway, they were able to reach the exposures of quartz and naturally established their shops on the nearest available spots. It is probable that the wide flood plain now under water was in those earlier days swept by strong freshet currents exposing the quartz-bearing formations over large areas, thus furnishing unusual opportunities to the quartz-working natives. These are precisely the conditions that prevailed in the river channel in front of the old village site at the dam, as shown by a photograph of the place made before the dam was built. Even if exposures of quartz were not found at the lower end of the "notch" they certainly did occur in the river banks a few hundred feet away, since at the present time, with a rise of ten feet in the water level, the quartz-bearing rocks are still exposed in the opposite bank of the river. Prof. Winchell is of the opinion that in early times this spot was probably the only convenient or available landing place near the head of the rapids, since the banks elsewhere were either steep or swampy; and it is not improbable that quartz obtained about the head of the rapids or even at the mouth of Elk river above, where veins occur, was brought to this spot in canoes and broken up and trimmed prior to further transportation. That the source of the quartz, or part of it, was really near at hand is attested by the presence of masses and fragments of considerable size on this site, and it seems highly probable that when these work-shops were occupied by the arrow-makers the quartz-veins were exposed somewhere within easy reach of the base of the "notch" and possibly within a few steps of the heavier accumulations of shop-refuse; but whether this be the case or not, the mystery of the origin of the quartz, dwelt upon by the original explorer, entirely disappears.

I may mention that there is a common misunderstanding in regard to the accumulation of this shop-refuse. Because it is plentiful and scattered over a considerable area, a long period and vast numbers of people are predicated, but so far as this site is concerned—and I speak from careful observation—one old arrow-maker, with a couple of squaws to gather the quartz, would in a few week produce as much refuse of manufacture as has ever been seen upon this site.

Approaching this subject, this particular group of phenomena, from my own standpoint—that acquired by a study of quarry-shop work and of the general conditions of modern aboriginal life—no other theory than that outlined above seems called for, and no other known theory will satisfactorily explain the facts as brought out by the study of the site; but there are those who may wish to understand how Miss Babbitt, who examined the spot with much particularity and dwelt at great length upon the phenomena, was able to reach such opposite and remarkable conclusions.

In order that the matter may be more readily examined by students I beg leave to present brief extracts from her writings, in which are embodied most of the essential points of her observations and interpretations. Having carefully described the site and the occurrence of quartz fragments and artificial forms, she states her objections to a recent and neolithic origin for the quartzes, arguing that the phenomena could only be reasonably accounted for by assuming that the quartz was flaked and distributed during the accumulation of the gravels and before the pre-glacial, outcropping veins were buried by



the rapidly accumulating deposits: and inferring that the artificial forms, being exclusively rude, are without doubt, paleolithic. Having formulated these views it remained only to assume that the river in cutting its post-glacial channel had exposed and disturbed the artificial deposits leaving them as found today. The following arguments are given in support of the positions taken:

"The spot appeared to be peculiarly unfitted by nature for a base of quartz-working operations. It was unintelligible, for example, why an important industry of this sort should have been established at so great a distance from quartz boulders and quartz-bearing rock, especially as convenient plains occur about the nearest exposures of this mineral. Again, why should such a manufactory have been set up upon a steep hill-side with its approaches of such a character that all the material to be handled, as also the implements fashioned, would have to be transported to and fro, up and down a considerable acclivity? Above all, why should this workshop have been relegated to the bottom of a natural drain, the solid contents of which were necessarily overwhelmed, or swept away bodily, at every considerable rainfall and thaw of the year? As an illustration of the superficial disturbance to which the place was subject, I may mention that at the close of a long, but by no means exceptionally protracted rain-storm, I once collected from the notch, by actual count, about one thousand quartzes, all newly plowed out of the soil at that one time. Of this I was certain, as I had previously cleared the ground of every quartz piece of any size from view.

"A final fact, wholly irreconcilable with the hypothesis of neolithic origin, was the absence of quartzes from the surfaces at the superior edges of the notch, and along the terrace plain adjoining. It was not for a moment to be believed that such remains would have been thus distributed by aboriginal artificers. It was simply impossible that the quartz-workers should have limited their manipulations to a strip of sand six or eight feet wide and thirty to forty long, less or more, heaping upon this narrow defile thousands upon thousands of fragments, yet leaving absolutely no small splinters nor chips beyond, neither up the slopes of the notch nor elsewhere in the vicinity. \* \* \*

"Prolonged investigation ensued, establishing the hitherto unsuspected fact that the notch quartzes could never have been directly involved in the terrace surfaces. Had they once been thus inhumed, the superficial stratum of adjacent drift would assuredly have been found to contain a greater or less proportion of similar fragments, scattered throughout its substance. But this was not the case. On the contrary, no buried quartzes whatever appeared in the superior exposures of the notch; nor within the horizontal surfaces at either hand, though such were sought with careful scrutiny. \* \* \*

In the light of what I have already said and expressed in fig. 2, it would seem unnecessary to comment upon these extracts as the misapprehensions embodied in them must at once be apparent to the discriminating student; but a few points may be briefly referred to. The statements in the first paragraph quoted, that the site must have been distant from the source of supply of the raw material and that it was, on account of its topography, wholly unfitted for shop work are, as I have shown, entirely invalid. In speaking of the agencies that wash out and transport the quartzes the author reveals accidentally one reason for their occurrence in a bed at the mouth of the "notch," for it was

through this washing out and through the action of gravitation that portions at least of the products of the scattered shops on the slopes and terrace margin above were carried down to this spot. At the same time this was probably the natural location for the main shop, the spot where all masses of large size would be broken up and assorted, since it may have been the only approximately level ground about the landing at the base of the terrace. The argument against a modern origin for the quartzes based on peculiarities of distribution, falls through when the true conditions are known, these conditions being exactly such as would result from recent occupation of the river landing by our Indian tribes.

In the second and third paragraphs it is emphatically denied, as an essential feature of her case, that flaked quartzes occur at any point above a horizon some twelve or fifteen feet lower than the main terrace level. This, as my careful dissections show, Figs. 2 and 3, is entirely wrong. The deposit seen at this level was not interbedded with the gravels and was not a stratum. Apparently Miss Babbitt did not see the gravels in place and probably did not approach them within a distance of many feet at the level indicated. I have shown that the quartzes were not confined to a given level, but occur at all levels, not only the surface but apparently in nearly every square yard of the surface loam within a radius of one hundred and fifty feet from the supposed bed of paleoliths. It is not necessary to dwell further upon these extracts or to review other parts of her work, for, notwithstanding Miss Babbitt's evident sincerity and prolonged and praiseworthy attempts to reach the truth, it should be plainly stated that had she deliberately planned to misunderstand and misinterpret the more important phenomena of the site she could hardly have been more successful in accomplishing these ends.

It is clear that the section exposed by my trench discloses exactly the conditions and phenomena that would result from the occupation of the site by quartz-workers of our neolithic aborigines at any period subsequent to the exposures of the Huronian bed rock by the post-glacial river, and there is nothing in the conditions and phenomena of the site that will enable us to say whether the beginning of the quartz-working dates back one hundred or one thousand years. Considering all features of the evidence, however, geologic, topographic, archaeological and historic, the probabilities are very strong that the former figure is more nearly correct than the latter. It is much to be regretted that Mr. Warren Upham, the able and generally careful and discriminating geologist, should have been misled by the unverified statements of an inexperienced observer into constructing a section, repeated by Prof. Wright, in which an implement bearing bed is carried entirely across the immediate valley of the Mississippi at the base of the glacial deposits.

Having shown that there is no evidence of the presence of man in this locality during the earlier stages of the gravel-forming epoch, the proposition affirmed by Miss Babbitt, I desire now to examine briefly the evidence relating to his presence during the final stages of that era, as outlined by Prof. Winchell. It has already been stated that the early observations of the occurrence of worked quartzes in the superficial glacial deposits are in every respect correct, and identical observations were made by me on the Babbitt site in carrying the trench up over the level surface of the terrace. At all points within a radius of about one hundred and fifty feet from the Babbitt deposit the quartz fragments were

distributed through the loam to the depth of from three to four feet. The same conditions were observed at other points, and I was at first entirely at a loss to account for the phenomena save on theory, suggested by Prof. Winchell, that man lived upon the flood plain of the Father of Waters, at this point dur- later glacial times, shaping there his rude implements of quartz. But as my observations were continued and carried over a wider field, I encountered facts that did not readily accommodate themselves to this theory, suggesting the need of other explanations. Some of these puzzling facts may be enumerated.

In the first place it seemed strange that the quartzes found in the loam should be confined exclusively to the sites occupied or naturally resorted to by modern tribes, who, as I have shown, left refuse identical in character and material with that found in the loam. In the second place, these quartzes were not in beds or layers at definite depths beneath the surface, as if made and used on the site at intervals in glacial inundation, or as if distributed from sites of manufacture by water during the formation of the deposits. It seemed a most significant fact that they were, in all observed cases, distributed somewhat uniformly through the stratum of sand extending from the surface downward, as if let into the deposit from above by some disturbing agency. In the third place, as Prof. Winchell has observed,\* there were, so far as can be determined, no exposures of quartz veins from which the raw material could be obtained at the period of gravel deposition involved; and, in the fourth place Prof. Winchell had, at another point, secured neolithic implements from this same deposit.† So strongly were these suggestive observations impressed upon my mind that I felt impelled to begin the search for more definite evidence and especially for evidence of agencies that could have served to introduce articles of modern make from the surface. Fortunately it was not necessary to go far. In digging the trench on the Babbitt Site it was observed, as shown in Fig 2, that the rotting of the roots of large trees would permit the lowering of surface objects into the superficial deposits, and that as a result general distribution would in time result; but this did not seem to be a sufficiently potent agent. It was also apparent that distribution, such as that observed, would result from disturbances of the soil by burrowing animals, like the gopher, badger and prairie dog, by the wallowing of buffalo, by the cutting of paths by elks and by excavations made by men, but these were not entirely satisfactory agencies, as they were not within the range of present observation. I passed up and down the margin of the terrace, examining each exposure of the strata and every contour of the bluff. I soon found that the winds had played with these surface sands and that dunes had accumulated in places to the depth of from three to five feet, giving rise to obscure elevations along the edge of the terrace; and it appeared that any part of the loam could thus have been worked over within recent times, distributing the bits of quartz from surface shops throughout the mass. Any one of these observations would have been sufficient to enable me seriously to call in question the conclusion that the quartzes were originally included in the loam, but I sought an agency entirely competent and satisfactory.

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\*Winchell, N. H., 6th An. Rep. Geol. Survey of Minn., p 57.

†Ibid. p 60.

Passing through the western part of the village I came upon a large area recently cleared of its growth of young forest trees. The surface was varied by countless humps and hollows, and I found, by careful inspection, that it was the site of ancient forest which had been uprooted by a tornado. A few of the great root masses were still preserved, and in some cases where the wood had entirely disappeared, the mounds of earth were still three feet high and the associated pits or hollows were nearly that deep. The humps and pits were so numerous as to disturb nearly one-half of the original level surface of the ground and the disturbances must have extended in many cases to a depth of from four to six feet. Here, evidently, was the distributing agency sought, and one entirely competent to accomplish all that had been observed of distribution. Not only was this much obvious, but it appeared, further, that a factory site upon which relics were distributed, disturbed by such an uprooting of forest trees, could not do otherwise than present exactly the conditions observed in the loams of the terrace plain. Indeed, it may be said that in a locality where forests grow on and in deposits so unstable as are these Little Falls loams, it is impossible that surface accumulations of articles of stone should remain for a long period entirely upon the surface; and the explanation thus furnished of the distribution of the worked quartzes of this locality through the glacial deposits, to the depth of four feet or more, is so satisfactory that no other theories are called for and little further discussion seems necessary.

The process of distribution of surface articles throughout the superficial loams by this agency may be illustrated by a series of sections. The section presented in Fig. 3 exhibits the conditions of a cluster of shop sites such as had accumulated on the prairie margin when the manufacture of quartz implements was going on. There may or may not, have been a forest at the time without affecting the final result although a longer period must be allowed if the

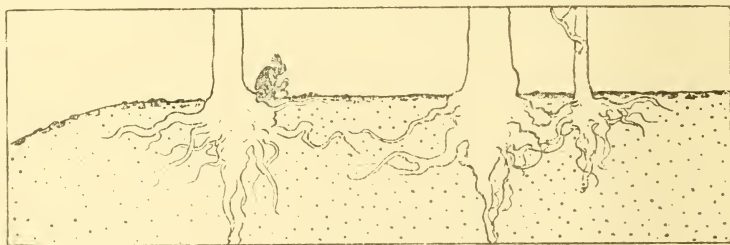


FIG. 3. Normal distribution of recent quartz shop-refuse upon the prairie surface, the black angular figures representing the refuse.

forests had to grow after the site was deserted by the arrow-makers. The immediate result of the uprooting of a forest upon such a site is depicted in Fig. 4. Portions of the quartzes would descend into the pits and portions would be



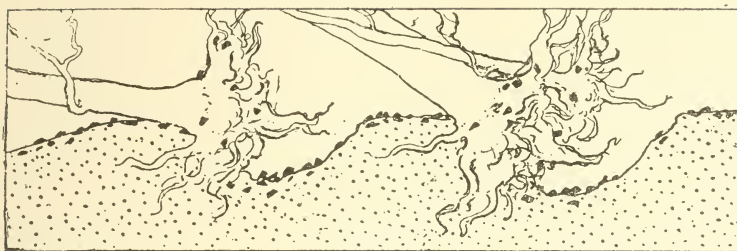


FIG. 4. The effect of uprooting of trees on surface relics.

carried up with the roots. When the wood rotted away the quartzes would be distributed over the mounds and in the hollows somewhat as shown in Fig. 5



FIG. 5. Distribution of quartzes over humps and in hollows after the rotting of uprooted trees.

and by the time the elevated portions of the soil had again settled into the general level of the prairie the conditions would be pretty much as indicated in Fig. 6. This result is really most remarkable, yet, as I have shown, inevitable—time being allowed—under the conditions existing at Little Falls. It is seen that in the period occupied by the uprooting and decay of a forest and the settling of the loose earth back to its original level, the modern quarry-shop

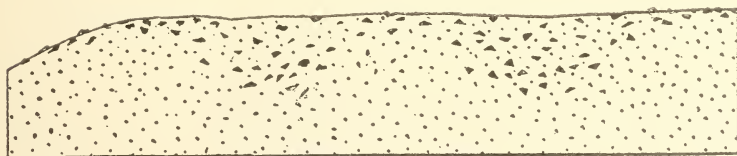


FIG. 6. Distribution of quartzes resulting from forest uprooting, exemplified in the surface deposits of Little Falls.

site with its bed of fragments, flakes and failures may be so changed in character as to afford striking proof of a paleolithic man of glacial age. The record may be so altered in the period of a generation as to be read ten thousand years instead of fifty. Such is the magic of nature's transformations and such are the pitfalls set for unwary explorers. It is true that since the occupation of this site by the quartz flakers, many forests may have fallen, but proof of this must necessarily be hard to secure, and if secured must still fall short of carrying the history of man back to glacial times.

In support of the theory that man dwelt in the valley of the Mississippi some ten thousand years ago it is pointed out that artificial quartzes are distributed through portions of the superficial glacial deposits. I have shown that there are many ways in which this distribution could have taken place under modern conditions and through causes operating within the century. It may be objected that I have really proved nothing with respect to the recent introduction of the quartzes into the loams of this particular site, but I would observe that this is not essential. I have shown that the presence of worked quartzes in the unstratified, superficial loams furnishes no real support for the theory of a glacial man.

In the study of this site, three problems have come up for consideration, first, is there evidence of human occupation of this locality early in the gravel-forming era as deduced by Miss Babbitt from the discovery of worked quartzes along the base of the terrace? second, is there evidence of man's presence at the close of the glacial epoch, as indicated by the occurrence of art forms distributed through the surface loams? and third, is there evidence that the art or any part of the art attributed to either of these horizons is paleolithic? All of these questions may be answered emphatically in the negative. It is clear from the facts presented in the preceding pages, that had a thoroughly careful and well directed study of the phenomena of the site been made in the first place, the first and last of these questions need never have arisen.

The mistakes made by Miss Babbitt are precisely such as others have made through taking up investigations in the geologic department of archaeology without adequate knowledge either of the processes and phenomena of geology or of the arts and habits of our aboriginal peoples. It is manifestly easier to explain the puzzling phenomena of prehistoric archaeology in America by current theories borrowed from foreign sources, than to attribute them to conditions and causes of which no knowledge has been acquired. Like mistakes are made to some extent by all students and at all stages of progress in research, and it must be regarded as a duty rather than as a charity to pass lightly over all such shortcomings in the work of genuine investigators: at the same time our highest duty is to science, and vital errors, no matter what their origin, should be unhesitatingly pointed out, and expunged from the records.

In closing, it may be stated with entire confidence that there is no available evidence of either a paleolithic man or glacial man in any part of the upper Mississippi valley. So far as my own observations and interpretations go, the vestiges of early man in Minnesota are confined exclusively to ordinary traces of Indian occupation. Considering the facts observed at Little Falls, and all the known ethnic phenomena of the region, this conclusion is so simple and

natural that it ought to stand unquestioned until positive proofs to the contrary, proofs not yet foreshadowed, are brought forward and subjected to the tests of science.

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## ARCHÆOLOGY OF PERU.

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Concluded.

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[BY G. A. DORSEY.]

**A**N eight hours mule journey to the east of Cuzco brings one to the valley of the Yucay. This valley for a distance of about thirty miles must have been once an earthly paradise. Its elevation is about eight thousand feet above the level of the sea and it has a mild, even temperature throughout the year: On the western side it is shut in by the walls of the plateau of Cuzco rising abruptly five thousand feet. The eastern barrier is formed by the giant spur of the eastern Cordillera, whose crest is one unbroken mass of snow and ice. The flora of this region is probably the most luxuriant of that of any part of Peru outside of the Moutaña. The valley is watered by the Urabamba, the parent stream of the Amazon, which we had seen two or three weeks before taking its rise from a tiny marsh lake one hundred and fifty miles south of Cuzco. This river for the greater part of the valley flows through banks artificially made with cut stone. In many parts of the valley the sides of the mountains are terraced. Often these terraces are many miles in length, following the natural curve of the valley, and rising a thousand or more feet, present a beautiful and graceful appearance. These formed the *Andenes*, or hanging gardens of the Inca chieftains or rulers who made this valley their summer home. At the upper end of the valley is the fortress and palace of Pisac. The little town of Pisac stands on the east side of the valley close in at the foot of the mountain. The fortress itself stands on a spur of the mountain almost six thousand feet perpendicularly above the town and is reached by a winding road which in many places is hewn out of the solid rock. The most interesting part of the fortress is the observatory, where the Incas carried on their astronomical observations. Leading from the palace, which stands near the observatory, there is a narrow path around the side of the mountain to a point where it presents a smooth perpendicular surface for several thousand feet. Into this almost inaccessible cliff the tombs were cut. It has been estimated that there are six thousand of these tombs within one mile of the fortress. Many of the tombs are perfectly formed and their entrances have been closed with cut stones. This was the usual mode of burial in this region, except that in some cases natural caverns, caused by the earthquakes, in the sides of the mountains have been used instead of the artificial tombs. The dead were prepared for burial in a somewhat similar manner to that practiced on the coast and in fact throughout Peru. The wrappings of

the body, however, were not solely of cloth as on the coast, but the body was enveloped in a coil of rope made of vegetable fibre, the face of the person alone being exposed. With the bodies, as on the coast, were placed the various implements, utensils and other objects used in life. The art displayed by the Incas\* in their pottery and textiles was of a more quiet, refined and artistic type than that of the people on the coast. The decorations were more often in color than in incused or stamped figures, but carved faces were often shown in relief. Many of the large wooden vases have portrayed on them in a very realistic manner scenes illustrative of mythological beliefs and daily life. One of the commonest scenes portrayed is that of a hand-to-hand conflict between the Incas and their savage neighbors, the Chunchas. From these we are enabled to form a very clear idea of the dress and weapons of the ancient, civilized and savage tribes.

Standing as sentinel at the lower end of the valley is the fortress Ollantaytambo. This beautiful fortress possesses a two-fold interest, inasmuch as it is the central point of the greatest of the dramas of the Incas known as Ollantay, and it is said that the fortress was built by the general Ollantay, who, because he could not have the consent of Pachacutic to marry his daughter, Cusi Coyllur, revolted and establishing himself at this point, built the fortress which bears his name and made a successful resistance against the combined forces under the royal leader, Rumiñahui, for ten years. The fortress itself is one of the most beautiful in Peru and one of the most inaccessible in all America. The little town of Ollantaytambo is for the greater part just as it was four hundred years ago and the people there today live in the original houses just as they were before the advent of the first Spaniards. The approach to the fortress is by means of an inclined road cut in the solid rock, finally landing one in a system of gardens or terraces still in a good state of preservation. Having gained the topmost terrace one passes along what is known as the "Nitched Corridor." It has its exit through a doorway of perfectly cut stone. One then stands upon a plateau-like spur and around him in every direction are the immense blocks of granite and porphyry, which lie strewn about in the greatest profusion and bear witness, as is the case with many of the wonderful structures in the interior of Peru, that the fortress was never completed. The most remarkable feature of the fortress consists of six porphyry slabs averaging fourteen feet in height, six feet in width and two feet in depth, forming the back of the fortress. They are joined together by means of small stones, but cut with such marvelous precision that in no single place can one insert the point of a knife. All the stones used in the construction of the fortress and the terraces were brought from the quarry on the other side of the river a distance of nine miles.

Above the fortress itself, at an elevation of 9,000 ft. above the valley, stands the house which tradition says was the private residence of the general Ollantay. It resembles very much the story and a half stone houses which may yet be found in New England, which were built in pre-revolutionary times. It is of cut stone with windows and doorways and is in perfect condition except the roof. This was originally probably of thatch and has long since fallen into de-

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\*Following a common use of the term Incas as applied to the people although used correctly this term should be confined to the chiefs or rulers.



cay. So far as I know, the only Inca structure still retaining its roof is that known as the Sondor huasi, which is about one hundred miles south of Cuzco. The roof of thatch and so perfectly constructed that it is in a good state of preservation to this day. The house of Ollantay was covered with a yellow stucco plaster which has retained its position and color. There are many other interesting features connected with the fortress of which we can only mention La Horca, or "the gallows." This is on the opposite side of a small stream which empties into the Urubamba and consists of two artificial projections in the face of the rock and at elevation of at least six thousand feet above the valley, from which capital prisoners were hurled to destruction below.

Here again throughout this system of fortifications one is amazed, by the enormous size of the stones which have been so perfectly joined together. As one rides along on his mule in any part of the valley he is able to discern not only the tombs, but houses often of considerable size placed at projecting points so inaccessible that one would think they were better adapted for a condor's nest than a human habitation. The valley of the Yucay is pierced in many places by smaller streams emptying into the Urubamba. Nearly every one of these valleys contain fortresses or palaces of regal splendor, and it is here that the future investigator who is looking for the splendor of the Inca rulers should seek.

The fourth great race or language stock of Peru is the Aymará. The region occupied by these people is that of the Titicaca basin, which consists of a great plateau five hundred miles in extent, which has been called the Thibet of the New World. The greater part of this region is in the modern republic of Bolivia embraces that portion of Peru drained by Lake Titicaca. The most prominent points of interest in this plateau are centered about Sillustani, Acora and Tiahuanaco. Besides these points the entire plateau is covered with groups of Chulpas, or burial towers. These are often fifteen to twenty feet in height, made cut stone and contained the dead with their accompanying objects. Many of the Chulpas in the Bolivian plains are made of adobe.

The ruins of Tiahuanaco constitute the sphinx of the New World, inasmuch as they were found in ruins by the earliest Spaniards, and there was no tradition concerning them in the possession of the people of that locality. I shall not attempt a description of the ruins themselves, for that has already been done many times before, but never better than in Squier's important work on Peru. I may be permitted here to state that there is no general work on Peru better than that of Squier which is indispensable either to the casual visitor or the archaeologist. His descriptions of the people, the ancient ruins, and the scenery are always painstaking, vivid, and trustworthy. At Tiahuanaco, as at so many other of the ruins of Peru, one is immediately struck with the idea of incompleteness. The entire plain lying between the ruins and the quarry near the mouth of the Desaguadero river is strewn with great blocks of sandstone and granite, many of them still in the rough state and others partially finished. The small objects which have been found from time to time among the ruins, such as gold, silver and copper ornaments, pottery and implements of stone, resemble very much those found in the older ruins of Cuzco and it seems to me highly probable that the ancestors of the same race that built the Temple of the Sun and the Fortress of Sachshuanan laid the foundations of the Temple of Justice, the Temple, the Palace, and the Fortress of Tiahuanaco.

Besides the structures already spoken of there are countless others, many of them equally well worthy of attention, scattered up and down the backbone of the Andes. Architecturally considered they bear no resemblance to the structures of Central America and Mexico. None of them are found on artificially constructed mounds. The true arch is never found, nor has the use of cement ever been discovered in any part of Peru. Many of these structures, however, are covered with a coating of stucco such as on the Palace of Ollantay, the temples on the islands in Lake Titacaca and many of the buildings of the Gran Chimú near Trujillo.

Looking now at Peru as a whole one is struck at the great energy displayed at every point by the ancient peoples. Although Peru is within the tropics, it possesses neither a tropical climate nor a tropical fauna or flora. On the coast people had to contend with a barren, rainless desert. In the interior they encountered narrow valleys shut in by almost perpendicular walls and each one practically isolated from its neighbor. The conditions which the earliest inhabitants had to face were certainly not inviting, but were such as to call forth all their energy and ingenuity. In many respects their conditions were similar to those which confronted the earliest dwellers of the Nile Valley. Like the ancient Egyptians they proved themselves competent to meet every emergency. On the coast they converted the hostile desert into a fertile plain. This was done, as we have already said, by means of the acequias, or irrigating canals and by the use of guano as a fertilizer. By these means they regulated their water supply and were able to secure a never failing rotation of crops. In the interior rain falls during certain periods of the year, and was not necessary to provide for an artificial supply of water. But the population in the fertile valleys soon became too large and it was necessary to increase the supply of arable land. This they did by means of terraces which was so skillfully done that their descendants today find them in a good state of preservation. It is interesting to note that the inhabitants of the province of Huarochiri assigned to them a mythological origin, thus bearing witness of their great antiquity. The fact that each little community was by nature practically isolated from its neighbor led them to build roads and these again were so well constructed that they furnish the only means of communication in the interior today.

From the capital of the empire, Cuzco, radiated a system of roads in every direction; some of them hundreds of miles in extent and often reaching to the coast. Where the road passed over the *despoblado*, as the barren, uninhabited places are called, they built *tambos*, or places of shelter where the tired traveler might remain securely sheltered during the night or take temporary refuge from the fierce snow storms which are so common throughout these regions. Many of the larger towns possessed schools in addition to their fortresses and temples. It is a curious coincidence that the present College of Cuzco is built on the foundations of the school supposed to have been built during the reign of the Inca Rocca, while the cloisters of the present Convent of Santo Domingo are practically the same as those used by the votaries of the Temple of the Sun, and the present Convent of Santa Catalina was formerly the sacred edifice of the Virgins of the Sun. The instruction given in the schools must have been somewhat of a similar nature to that of our modern manual training schools. In addition the students were taught the principles of astronomy and

religion. The political basis of the empire was a confederation of the Gens, whose representative was the Inca or head, whose position was hereditary through the female line. That the sway of the Inca was in many respects absolute as well as despotic is shown in the vast number of public works which could have been built only by the united efforts of countless people ruled by one mind.

Let us now look at the people of the Peru of today, for in many parts of the country we find the lineal descendants of the ancient Quichuas and Aymaràs. This is true, however, only of the interior. There is probably no such mixture to be found in the world as that now living on the coast. These people are commonly called Cholos, although there are no less than fifteen or twenty different names for the classes which have been formed by the intermarrying among the different races. The principal races which have contributed to this mixture are the native Peruvians, Spaniards, Negroes and Chinese. Besides these there have been, of course, a constant inter-marriage between the native people with nearly all of the European races. The Chinese were imported in large numbers about twenty years ago and were for many years held in a condition of slavery working on the plantations and in the guano islands. Their position recently, however, has been much better and now nearly all the petty shops on the coast are in their hands. The negroes were introduced early in the century and were employed principally in the sugar haciendas. The real Cholo, the off spring of the Spaniard and the Indian, forms of course the greatest part of the population of the coast. They are generally sober and industrious, but they believe greatly in the proverbial *mañana*, never doing today what they can do tomorrow, or better still, next week. However, they are always polite and good natured and if one will lead them instead of trying to drive them he can really get a great deal of work out of them in a day. The entire machinery of the Government is in the hands of the old families, the descendants of the old Spanish viceroys and early rulers.

In the interior the conditions are quite different. There, no such admixture is to be found as on the coast. In many places exist the lineal descendants of the ancient Quichuas and Aymaràs, living in much the same manner as did their ancestors four hundred years ago. They construct the same houses, wear the same clothes, eat the same food, but in every other way are probably not so well off. Four hundred years of serfdom and tyranny have not tended to raise their spirits or to increase their happiness. As one rides along on his mule every man, woman, and child, not only bows but removes his hat. It is done not as an act of politeness but of servitude. They are chiefly an agricultural people and have their patches of barley and corn, and their flocks of llamas, sheep and cattle. Under the long sway of too often degraded Catholic priests their ancient religion is only modified in that their superstitious beliefs have been encouraged and enlarged.

At Tiahuanaco I witnessed a three day's feast given by the church in celebration and in honor of one of its festivals. It differed in no essential feature from many of the original feasts as described by the earliest Spanish writers. At Huaracando, near Cuzco, before I could get workmen to assist me in making excavations among the ancient graves, I had first to secure an order over them from the *Gobernador*. With this military command the men consented to work, but first stipulated themselves with *ajordiente*, or native

rum and then went through a ceremony in which they disclaimed any willingness on their part to do the work, and with entreaties begged the spirits of their ancestors, as they recognized them, to direct their maledictions against us, as we alone were responsible for the sacrilege. In another part of the ceremony they said that there was no difference dividing them from their brothers and they professed themselves to be true children of the sun and worshipers at the shrine of the Great Pachacamac. But they said, "We know also besides the Great Sun, his son Jesus Christ and the Holy Ghost." The ceremony ended by their offering libations of *aguardiente*, *chicha*, and *coca* to appease the spirits of the dead in the tombs which we were about to enter.

[THE END.]

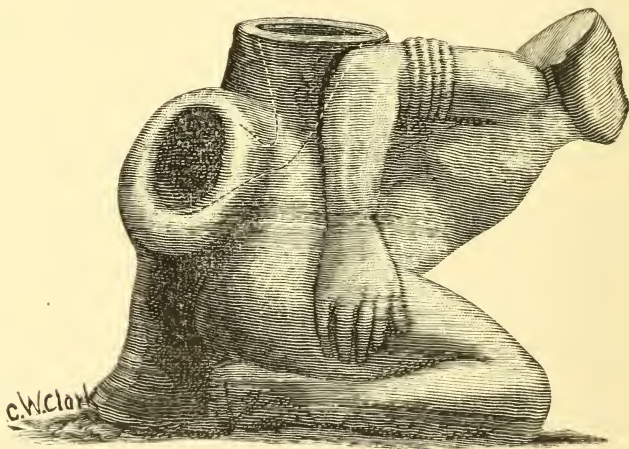
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### A SINGULAR PREHISTORIC PIPE.

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HIS singular pipe was found near the shores of a small lake in Coahoma Co., Miss., by H. J. Johnson, during the spring of 1893, while plowing. It was buried head down about eighteen inches below the surface. There were no mounds near, but many traces of mound-builders surrounded it,—crumbled brick, broken pottery, etc. About twelve feet from it





was found a small discoidal stone. The figure is that of a man in a crouching position, the arms bound with twisted ropes and the feet doubled back underneath it. It is very graceful, the only parts out of proportion being the hands, the reason for which is, that with the tools which they possessed they could not cut them smaller. The illustration is a little over half size, and represents the image well. The dotted lines show the shape of the bowl. The only mutilation is on the head, the top of which is broken off above the eyes. This is very unfortunate as it destroys the head-dress, a part of which still remains. The face is of the type common to the Southern tumuli, and is finely chiseled. The mouth is large and the lips fairly prominent. I would judge from what is left of the forehead that it was broad and high. The nose is large, but not flat like a negro's or like that of an Indian. The sculptor who could give a rough stone head such a pleading look as this one has, would be fully capable of giving the race characteristics. The wrist and collar bones and the ankles are carefully and correctly chiseled, as are also the finger joints of the right hand. The left is unfinished. Although unpolished there is a carefulness of execution about this image, a beauty of design and a knowledge both of anatomy and carving such as I have never seen equaled on stonework of this character. What is the meaning of this relic and where did it come from? It may be intended to represent the conquest of some noted chief who portrays the face and condition of his captured rival, as Mr. Moorehead suggests, or it may have been carved by the more civilized nations of Central America and got into the possession of the ruder nations of the north by barter.

CHAS. W. CLARK,

Wilbraham, Mass.

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NOTE.—The editor remembers having seen a pipe representing a bound captive in the possession of an Ohio collector some years ago. In that case the arms were similarly bound, but the effigy was smaller and hardly so well executed. The cut does not do Mr. Clark's pipe justice.

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## EFFIGY MOUNDS NEAR AURORA, ILLINOIS. ✓



HOSE interested especially in the subject of the imitative class of mounds have doubtless at times speculated on the geographical relations of the same, that is, as to how far such works extend in various directions from a given centre. It is a well known fact that their apparent headquarters are in Southern Wisconsin, a region in which these, the most interesting productions of the mound building period—the effigy mounds—once swarmed, if the expression may be allowed. That they extend thence southward into Illinois at least 20 miles and are found in that state as far east as the valley of Rock River has been shown in a previous article.\* But that they are to be met with fully 50 miles south of the southern boundary of Wis-

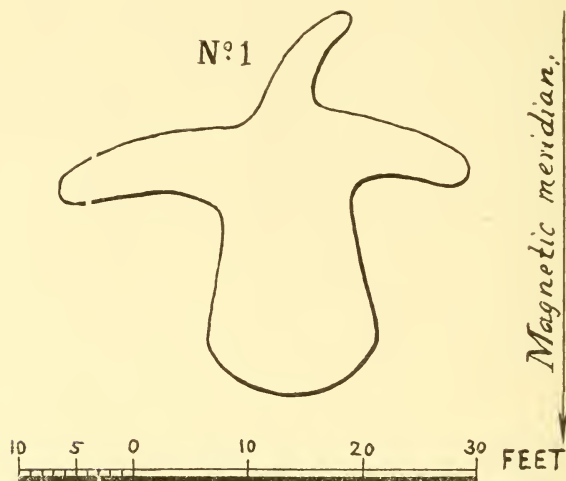
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\*See "Science" of Sept. 7, 1888.

consin in a slightly lower latitude than the mouth of the Chicago River and within thirty-five miles of it, has not hitherto been demonstrated.

During a trip to Northwestern Indiana and Northeastern Illinois, in the latter part of August and the first of September of last year, a faithful examination of that region was made with a view to ascertain the southeastern limits of this class of works. This boundary, or assumed boundary, was found to be on the east side of the Fox River, just north of the city limits of Aurora, in Kane county, Illinois. Here there are to be found two groups of mounds, located on the sloping edge of the terrace which is about twenty-five feet above the river and one hundred and fifty yards distant from it.

The northern group is on the N. E.  $\frac{1}{4}$  of the S. W.  $\frac{1}{4}$  of Section 10, township 38, north of range 8, east, and consists of three round mounds and two effigies

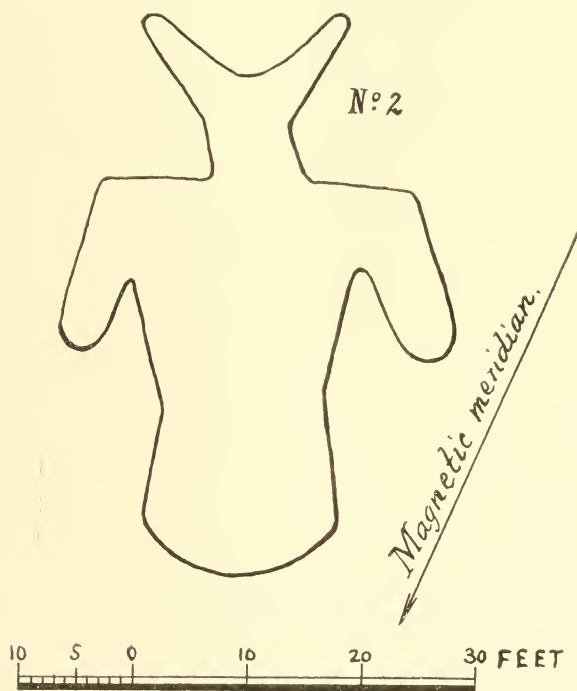


representing birds. Of the latter No. 1 probably represents a duck or some similar bird having a long neck. It is 34 feet in length, 36 feet from tip to tip of wings and  $1\frac{1}{2}$  feet in height. No. 2 is some 50 feet in length and the body is 2 feet in height. Effigies of this class are usually called "owls" from the horns or feathers which protrude from the head.

The second group of mounds is located to the southward about one hundred and fifty yards on the slope of the same terrace and are on the S. E.  $\frac{1}{4}$  of the S. W.  $\frac{1}{4}$  of the same section. It consists of two bird effigies, one elliptical mound and thirteen round mounds, of which one bird and five round mounds were surveyed. The remaining mounds were more or less defaced, the major portion of some of them having been carted away. The surveyed effigy (No. 3) which is intended to represent a bird, may properly be classified as conventional in form—the form reminding one of a cross shape, but the cross mounds once supposed to exist, have long since been known to be birds. It is 32 feet

in length, 36 ft. from tip to tip of the wings and  $1\frac{1}{2}$  ft. in height. This effigy is the most southern as well as the extreme southeastern one as far as is known. It has often been remarked that a very large proportion of the effigy mounds are headed in a southerly direction, though no adequate theory has yet been framed to account for the fact. The reader should notice the southern flight of these birds.

The geographical distribution of the effigy mounds can only be given at the present time in a general way. While there has been more or less work done in this field by different individuals and at different times yet the present



known limits of these works may be extended at any time by new discoveries in out of the way places.

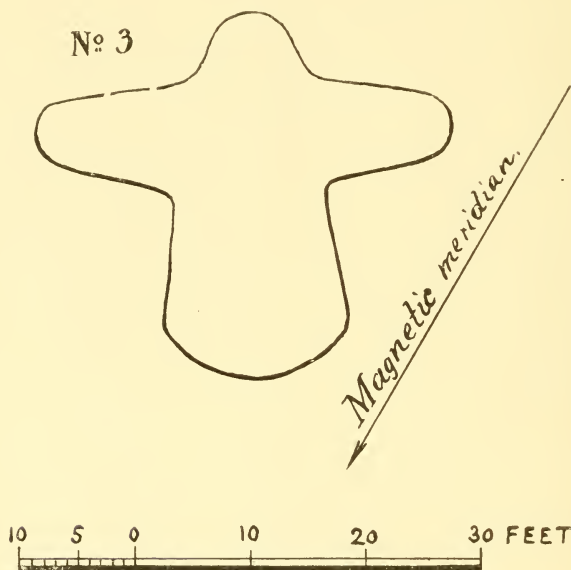
The extreme southwestern limit is in Lyon county, Iowa, eight miles south-east of Sioux Falls, South Dakota, where a somewhat rude effigy is found, valuable for its being the only known case occurring in the Missouri basin.\* For to the east of this in northeastern Iowa, near Farley and at Dubuque and thence along the Upper Mississippi Valley to within a few miles of St. Paul,

\*See "Science" of May 2, 1890.

more or less of these works are to be met with. The extreme northwestern limit is at a point on Crow Wing River just one hundred and sixteen miles northwest of St. Paul.

The northeastern limit is not so well defined and while effigies are reported as existing at some points farther to the northward, yet the vicinity of New London, Waupaca county, Wisconsin, may be considered to be the limit in this direction at the present time, so far as the reported locations have been verified.

It may be here stated that in regard to the several localities on the lower peninsula of Michigan where effigies were reported as existing, a thorough ex-

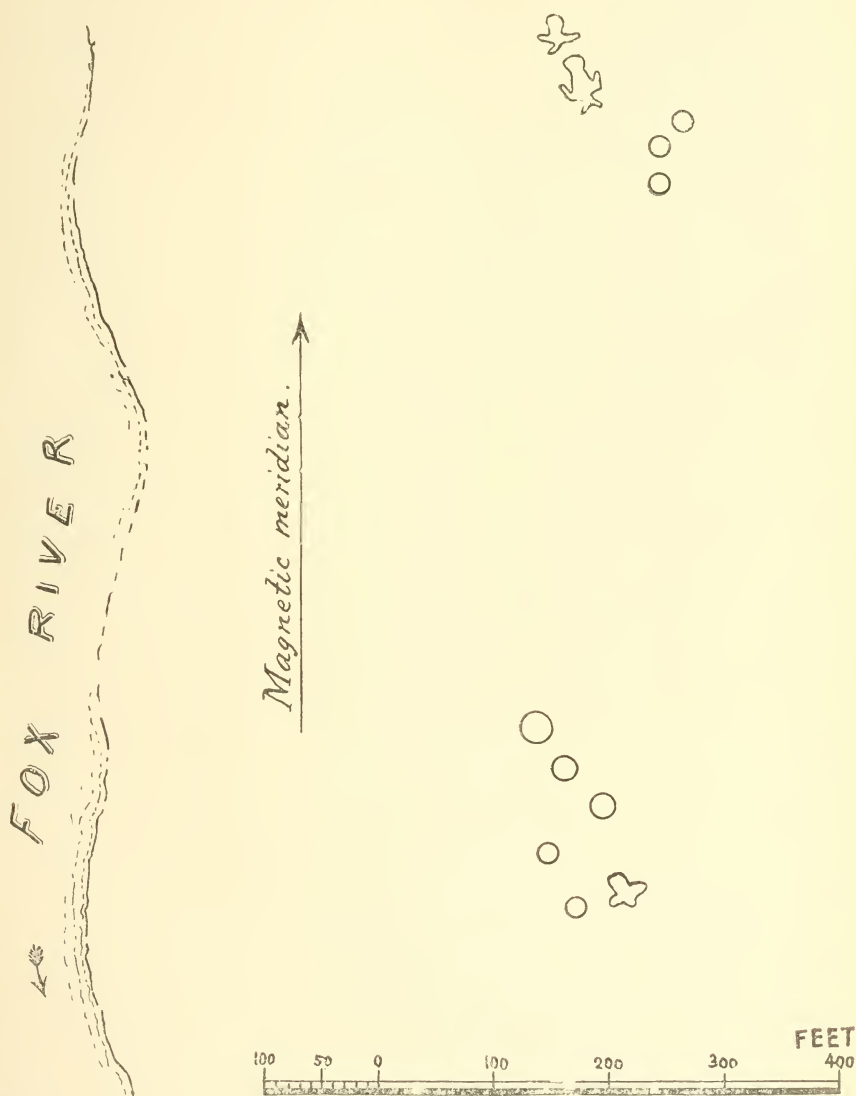


amination of the region was made—in August of this year—but they failed to materialize. It is evident that that state must now be abandoned as an effigy field, so that the eastern limit remains in that portion of the state of Wisconsin bordering Lake Michigan.

In speaking now of the distribution of the effigy mounds the Ohio Valley is not taken into account. The few to be found there—less than a dozen—must be considered as sporadic. From the effigies in Illinois described in this article to the nearest one in Ohio—the celebrated Great Serpent—is fully three hundred and twenty miles in a straight line going in a direction a few degrees to the north of southeast.

There may have been others constructed along the Fox river farther south





than Aurora, but if so, the effects of the general settlement of the country for over half a century, together with the continual tilling of the soil, have probably obliterated all traces of them.

St. Paul, Minn., Jan. 5, '94.

T. H. LEWIS.

# The ARCHÆOLOGIST

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## EDITORIAL.

In this day of many museums the lover of ancient things finds much material for study. With millions of relics on display in the larger cities of the land, and an extensive literature, —which, by the way, is constantly increasing—his longings are gratified. Curators and museum assistants, however, are far from satisfied. They feel the need of extended field operations, of collections from new regions. Looked at from their standpoints, museums have but begun the proper classification of anthropologic material,—and aside from in Ethnology, the American field is but superficially worked. Ambitious to solve questions of import, they desire to explore sections regarding which our present knowledge is excessively meagre. But there is an obstacle, one of magnitude;

i. e., lack of funds. During the uncertainty of the nation's finances, and the prevailing "hard times" museums have suffered. Men of means who have largely contributed to field funds in the past are loath to give until they are certain that they will not need the money in business. It could hardly be expected that museums would contemplate field work so long as the money market is uncertain. However, the editor hears from "the inside" that several small surveys will start out in May from two institutions.

Speaking of men of means calls to mind the great need of large sums for exploration. Museums have ample funds for publication, salaries and current. They have a superabundance of ordinary collections and do not need cash for purchase of specimens. But all of them sadly feel the need of field funds. What surveys might be projected and carried to successful termination, what wonderful discoveries could be made if a few of our citizens (with multitudinous dollars) would only decide to aid anthropology! On the interest of a well invested million, four surveys could be permanently continued, two in North America, one in Central America, one in South America. The reputation the donor would accrue, and the service to science would make him more famous than the perpetuation of his name through a college or a hospital. We have plenty of colleges and hospitals but no permanent surveys. There are many museums, but few real expeditions. The Egyptian Exploration Society is the only institution in the world carrying on permanent archaeological explorations. The United States could easily support four such surveys.

We can hope for some such archaeological millennium, as has been mentioned above, in the future. It would be

possible could one impress upon our millionaires the importance of the work and its benefit to civilization, but that task is arduous and difficult.

### An Outrage.

Collectors as a class are honorable and upright men and women: but there appear here and there a few rascals and frauds. These should be held well in hand by some journal of authority and therefore The Archaeologist feels called upon to expose all dishonest persons who use archaeology as a tool for illegal gains.

The worst case of fraud and deceit that has come to light in the past ten years occurred at Newark, O., some months ago. A veterinary surgeon died and left a large and valuable collection,—the labor of a life time. Several collectors of the neighborhood called with a view of purchasing it.

Knowing little about the collection she was in a position to be deceived by prospective purchasers.

The widow desired to sell at as large a figure as possible, for her husband's estate is insufficient to support her four children and herself. She left Newark for a few days and upon her return found the cellar door unlocked. She had taken special pains to fasten and lock the door in order to prevent any one from meddling with the collection. She spread out all the specimens and sent for several reliable persons to inspect the exhibit. All of them remarked how singular it was that the Doctor in his extensive travels should pick up no fine relics but only arrow heads, celts and ordinary axes and pestles. They said a collection of fourteen to fifteen hundred objects ought to contain some ornaments, drills, etc., and not poor specimens exclusively. In short they suspected that some one had taken the best part of it or that the doctor

had sold his most valuable specimens prior to his death.

She stoutly maintained that he never sold a relic, that he prized them too highly to ever think of a sale. She remembered that he had many fine objects, but could not specify just what they were. Circumstances which cannot be related here were made clear to the gentlemen present and the whole affair was plainly exposed. The best of the Doctor's collection had been stolen! We greatly regret that the guilty man is not known, nor can we go further than to say that it is probably some collector of the neighborhood. The collectors of Licking county, among whom the Doctor was well known, ought to investigate the unfortunate affair. They should realize the damnable villainy that must prompt a man to avail himself of the ignorance of a needy widow and rob her of her slender means. There are many wealthy men, honest men interested in Ohio archaeology in and near Newark. They should see that the widow (and they know her name) is properly cared for. Editorially we regret that the evidence is not sufficient to name the culprit.

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## COLLECTOR'S DEPARTMENT.

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### Information for Collectors.

(Continued.)

We might write fifty pages concerning the classification of implements, their supposed and known usages, and the best way to be observed in their arrangement. It is necessary to condense into as brief a statement as possible the information to be set forth in this and the ensuing number of The Archaeologist.

In this number we will consider implements and weapons, with the reservation that flint implements are to be treated of in the April number. Ornaments and ceremonials, together with various other objects, will be described in the May issue.

The grooved and ungrooved axes probably constitute the largest proportion of a collector's cabinet next to flint implements and pottery fragments. These specimens are usually made from hard stones, as the softer materials would not stand continuous wear and use. Specimens of axes and celts vary from 2 to 14 inches in length and  $1\frac{1}{2}$  to 8 inches in width. The variation in weight ranges from 4 ounces to 21 pounds. The average can safely be placed at from  $4\frac{1}{2}$  to  $6\frac{1}{2}$  inches for the axes and 3 to  $5\frac{1}{2}$  inches for the celts.

Of the celts there are several varieties. The ordinary celt, which is about  $\frac{3}{4}$  inch in thickness (on the average) and possesses slightly rounded edges, a fairly sharp point and a rounded top. Another type of celt is flat upon the back, slightly rounded upon the upper side, and has a sharp grooved edge. These specimens are greatly sought after by collectors and have a value in excess of the common types. They are usually made of hard granitic stones, and are highly polished. They have been variously denominated as "hide dressers," "skinners," etc. We do not give any name to a class. It is extremely probable that the aborigines could use the stones in their possession for almost any purpose, regardless of form.

All the celts, whether of ordinary form or of the highly polished and symmetrical "skinner" type, possess sufficiently sharp edge, either to be used in detaching hides from carcasses or if lashed to a short stick would make excellent hatchets or tomahawks

to be carried upon the war path. The smaller celts are frequently quite thick and one can scarcely see how the savages could use them to advantage. This can also be affirmed of the larger celts, a few of which weigh from 5 to 12 pounds. No good explanation has been offered regarding their use. Celts are found in large numbers upon village sites and in fields where no village seems to have existed. They are also frequently taken from mounds and graves. They seem to have been the common implement in the homes of pre-Columbian Americans and next to the flint implements are the most numerous objects found throughout the United States.

Celts occasionally occur in copper and in shell. The copper ones seem to have been ceremonial. Some ceremonials or ornaments of slate have a form almost identical with the finer of the celts and are often mistaken for cutting or chopping tools. There is no evidence that so soft a stone as slate was used for any other purpose than for ornaments, ceremonials, totems or marks of rank.

The grooved axes form a somewhat more interesting class than the celts. I have divided the axes into two classes. Those which have the groove all around and those which are "flat-blacked." The latter have a groove extending  $\frac{3}{4}$  around the stone. The axes can be even more sharply classified than the celts. There is a type common in Southern Ohio which varies from 5 inches in length and 2 inches in width, to 7 inches in length and  $3\frac{1}{2}$  inches in width. It is usually three-sided having the back flat and the outer or front side slightly rounded. It is almost always made of hard stone, and shows a high polish. The back is often slightly curved concave in order that a wedge may be driven between the fastening and the handle and the



implement thus more firmly secured in this position. Another type in the South is the axe which has a groove extending entirely around it. I never could quite understand how such a specimen could be as securely fastened to the handle as the three-cornered kind. The "all around groove" axes are larger than the triangular ones and often reach 10 or 15 pounds in weight and a foot in length. It has always been a puzzle to understand how an axe of such weight could be used to any advantage. Various theories have been suggested, but none of them have seemed adequate for the occasion. A type very common throughout the Mississippi Valley is that of a small 7 to 12 ounce "all around groove" axe. This could be conveniently lashed in a short handle and carried upon war expeditions or used effectively in crushing the skulls of large game captured in the chase.

Axes have seldom been found in mounds or graves. I have read of such cases, but in 117 mounds, and upwards of 300 graves opened under personal direction, I have failed to find a single grooved axe. The manufacture of both grooved and ungrooved axes could be entered into with considerable detail. But probably readers of this magazine are familiar with the particulars. I will mention it but hastily. A water-worn pebble, as near as possible the desired size, was selected. This stone was pecked and pounded until something like the future form was outlined. The groove was formed by grinding and polishing after having been rudely pecked to some depth. The manufacture of either an axe or a celt required not more than a day's time. Many of the specimens give evidence that they have been but little worked. In a large percentage of celts the edge is upper portion being rude. The axes,

sharp, well made and shows usage; the of necessity, would require more time than celts. But one or two perforated axes have been found in the U. S. They seem to have been made since the introduction of the iron axe as the American aboriginal idea is to put the stone in the eye of the handle, and not the handle in the eye of the stone. Axes with two curves about them are also extremely rare, and can be safely labeled as freaks and not as representing the regular, the customary type of these implements. We cannot give even approximately the number of axes and celts in museums and private collections of the United States, but judging from the total number of specimens and the proportion usually occupied by such specimens in each exhibit, there may be from a million to one million two hundred thousand axes and celts at present in cabinets.

Stone hammers, mauls and pestles come in this classification. The mauls are found largely in the neighborhood of the ancient copper mines of Lake Superior, at the flint quarries of Arkansas and Central Ohio and on the plains of the West. They have been used for diversified purposes. Upon the plains by both modern and pre-historic savages for the breaking of heavy bison crania in order to get at the brains, for the splitting of the long bones of the skeleton in order to extract the marrow and at the points named above for various purposes. Hammers found upon village sites have been used for a series of purposes. To drive pegs, pound hides, to break stones, etc., etc. The hammers are mostly grooved, although those which are ungrooved may have been fastened in raw hide and attached to the ends of sticks to be used as war clubs. Many seem to have formed a part of a squaws outfit; others have been carried upon the expeditions of the war-

rriors. Hammers found throughout Ohio exclusive of Flint Ridge, will average about  $\frac{3}{4}$  pound in weight. Those occurring upon the great plains of the west vary from 2 to 10 pounds, while the thousands found at the flint quarries and upon the site of ancient copper mines, range from 15 to even 30 pounds in weight. The form suggests the use and very little need be said regarding them.

Pestles are even more widely distributed than the classes named above. They are of two forms, the short flat base and tapering cone-point variety and the long roller-shaped form. The latter are more numerous on the Pacific coast and throughout the South. The former seem to be confined largely to the tribes of the Mississippi Valley. Only a few of either type exist throughout the East.

Pestles indicate an agricultural people more than any other implement, as they were largely used for the grinding of corn, beans, seeds, etc. Few of them have been found in the Pueblo and Cliff Dweller Country of the southwest. The tribes of the San Juan and Colorado River Valleys use a flat rubbing or grinding stone and a larger table or slab upon which the corn was ground. In Mexico and Central America the rubbing stone and the table occur to the exclusion of the pestle and the roller.

Pestles vary from 4 to 8 inches in height; the rollers from 6 to 30 inches in length. Many of them show a wearing away of one side, as if held continuously in a certain position. Throughout the various river valleys of the Upper Mississippi and Ohio, where corn was cultivated in large quantities by the aborigines, pestles occur by the thousands. In the South the rollers (and occasionally in the North) are found by the hundreds. The corn seems to have been placed

upon a flat stone, or in a wooden cavity, and ground. There is no evidence that a table or flat slab was used continuously as among the tribes of the southwest and Mexico.

Collectors often exchange unfinished specimens such as are included in the class enumerated in this article. The unfinished axes, pestles, celts or hammers, illustrate the various modes of manufacture of these interesting types and are extremely valuable.

The editor of this department would insist upon the preservation of all rude or types generally considered worthless. It is only by a study and comparison of these aboriginal incomplete forms with perfect specimens that a comprehensive idea of the manufacture of axes, pestles, celts and ornaments can be had. The collector who preserves only the perfect specimens of these several varieties, not only does nothing whatever to aid the progress of archaeology as a science, but properly belongs in the same class as children who collect spools or cancelled stamps, buttons, etc., just to ascertain how many they can get.

There is not a well authenticated instance where a grooved axe has been found in a mound or a grave. It is therefore very important, if such discovery be made that the finder notify proper authorities.

In the next number of *The Archaeologist* a more lengthy article regarding flint implements and their uses will be presented to readers.

(To be continued.)

### Wampum Belts.

(By Rev. W. M. Beauchamp.)

Much has been said about the antiquity of the Iroquois wampum belts which is quite misleading. Not one of them is old, and there is very little council wampum in existence which was made by Indians. Loskiel said

that the Iroquois had no shell beads of this kind until they obtained them through the Dutch, but that they at first used small colored sticks in their councils. Morgan said much the same about the wampum made of sea-shell, but thought they had some made of fresh water shells before that time. As a matter of fact, while the small wampum is abundant on all recent Iroquois sites, shell beads of any kind are among the rarest of all finds on any prehistoric or early interior New York sites, and it is much the same in Canada. Where the small council beads occur, not one in a thousand is of Indian manufacture. These are easily distinguished, the Indian beads being usually larger than those of the whites, having a larger perforation made from both ends, the two conical holes meeting in the center. Those of the white man have a smaller and uniform perforation.

The Iroquois attribute the first use of wampum to Hiawatha, who seems to have lived at the close of the sixteenth century. One story makes his wampum of quills, and another of fresh water shells.

When the Dutch at last brought them wampum, the Iroquois prized it highly, and it appeared in most councils, but much of that mentioned by the French was of porcelain beads, with which the shell beads are now found mingled. So valuable was it in trade that it became and long continued a legal tender in New York. It entered largely into Indian ceremonies and treaties, replacing the sticks and beaver skins used before. It was made into symbolic belts, and both Indians and Whites become adepts at this. Squares and diamonds stood for castles, men for states or nations, lines for roads, and there were many other devices. White beads represented purity or peace; purple something of a serious nature, but the latter was double the value of the former. Even in

councils its value was not forgotten, as the belts given were sometimes taken apart and divided among the nations. Belts contained messages or agreements, but strings were often used. Every Iroquois messenger now carries a string of wampum as his credentials, and at condolences they are freely used. In these ceremonies strings represent nations, names, addresses and laws. A particular arrangement of the strings conveys some special meaning, and sins are confessed on them at the burning of the white dog. A full set of chief's wampum is quite a study.

For a long time the Dutch made most of the wampum in use west of New England, furnishing supplies to Canada. It was quite a business still in New Jersey less than fifty years ago. Sir William Johnson, by his free use of belts, gave a great impetus to the trade, and the broad belts became more abundant than were before. They were made of long pieces of buckskin or twine, the beads being placed transversely between these. As a rule they were narrow, but one at Onondaga is 49 beads wide, and some others are nearly equal in breadth. All at that place are modern, as I have closely examined them; all being of white manufacture, and several of them on a foundation of twine. No belts probably escaped plunder at the sacking of the Onondaga towns in 1779, so complete was the surprise, and it is proper to give a later date to all of these.

These little beads vary considerably in length and thickness being reckoned by the fathom on all state occasions, but having a fixed value by the bead. Sometimes they were at a premium, but sometimes, through lack of care in making, there was a debased currency estimated accordingly. A quarter of an inch is the usual length. The width of a belt may be reckoned from this making due allowance for the intervening thongs.

After white contact, shell beads, gorgets and other ornaments quickly increased among the Iroquois, and some of these were of large size and fine workmanship. Although not so elaborate some of the gorgets are quite suggestive of some of those from the South. Besides the common council wampum and the larger beads, I have a few small disk beads from an Oneida site, such as the western Indians use.

I have not seen these elsewhere. Very rarely a disk bead may be found of an earlier date. One or two made of unio shells have met my eye, like those. I have had from western graves. Very rare, also, but more common, are the long columeleae of sea shells and occasionally small sea shells appear strung for ornament, appear strung for ornament. This early scarcity of shell articles is a remarkable feature of New York sites in the interior, showing little early intercourse with the Atlantic coast. From that the Iroquois were shut off by hostile tribes, and their early homes show little that is foreign to the soil.

In one case only have I known of a cache of unfinished shells, and that near the Pennsylvania line. There were about a score of pieces, chipped into rude disks of about an inch in diameter, and embracing several species of bivalves. Stone beads, like the "lucky stones," occur rarely, and I have seen a few beads of baked clay. Fine venetian beads are yet met with, though not as large and beautiful as in the earlier finds. Bugle beads are common, but those of red porcelain, about the size and form of a pea, are oftener seen.

BALDWINVILLE, N. Y.

### Peabody Museum, Harvard University.

After an absence of fourteen months during which time he has been in charge of the Department of Ethnology at the World's Fair, Professor Putnam has returned to his duties in Cambridge. He has brought with him several of his students and assistants who were associated with him in the department.

Regular instruction in anthropology has now been resumed for the second half of the college year. Heretofore the instruction has been confined to graduate students, but now there will be courses offered to undergraduates as well. The announcement of these courses has been received with much pleasure by the University and the fact that regular instruction in the Museum is to be free to all students will surely prove a source of great additional interest in anthropology, not only in Cambridge, but throughout the entire country. There is every

reason to believe in the near future the Museum will become the center of the most advanced research work done in anthropology in America.

At present there are two graduate students pursuing advanced work under Professor Putnam and both are to become candidates for the degree of Doctor of Philosophy in the Department of Ethnology. It may be noted here that Harvard is the first American University to offer the Ph. D. in this branch of science.

During the past year one of the new halls of the Museum has been provided with cases and in it have been arranged the collections received from the several Museum expeditions covering the last five years in Yucatan and Honduras. This room will not be open to the public until the arrangement is entirely perfected, a few months hence. It contains copies of the large monoliths, stellæ as they are now generally designated from the ruins of Copan. With the stellæ are several of the great carved stones commonly associated with them and known as altars. Both the stellæ and altars are elaborately carved with human figures and lines of hieroglyphs.

In their hall are also arranged the numerous casts of sculptures and hieroglyphs from Yucatan and some of the old cities Guatemala and other parts of Central America. These include a full series of the Charney casts as well as those taken from the molds derived from the Museum expeditions.

Around the walls of the room are many photographs illustrating the ancient architecture of Yucatan and Honduras. In the table cases are displayed the innumerable small objects found on the Museum expeditions. There are also many pieces of sculpture from Copan. One piece deserves special mention for it is probably the largest specimen of Copan sculpture in the United States. It is the life size figure of a person in sitting posture and decorated with a most peculiar head-dress, in the form of the wide open mouth of some large animal.

There are many other interesting objects in the room but enough have been mentioned to show it contains much that will be of profound interest to students of American archaeology.

"STUDENT."

CAMBRIDGE, Mass., Feb. 15, 1894.



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No. 4

## PRIMITIVE COPPER WORKING: AN EXPERIMENTAL STUDY. ✓

BY FRANK HAMILTON CUSHING.

From the *American Anthropologist*, Washington, January, 1894.

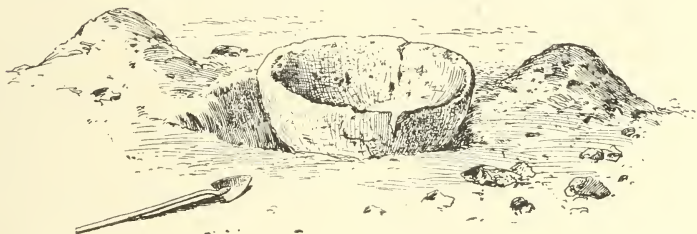


FIG. 1.—Ancient furnace exposed by excavation.

At a meeting of the Anthropological Society of Washington, held November 15, 1892, Mr. Warren K. Moorehead read a paper on "Singular Copper Objects from Ancient Mounds in Ohio." These objects were described as discovered by himself in great numbers in the so-called Hopewell group of mounds, while conducting explorations for Professor Putnam of the Anthropological Department of the Columbian Exposition. They consisted mainly of numerous figures, large and small, made of sheet copper. Many of them showed outlines and open-work cuttings of surprising regularity, neatness of finish and intricacy of design. The plate-like figures were of nearly uniform thickness, but the thickness of individual

specimens slightly varied. Although these specimens exhibited characteristic Indian modes of artistic treatment, it was thought that a primitive people like the so-called mound-builders, being unpossessed of a knowledge of smelting or of tools of iron or steel, could not have fashioned plates of such size and uniformity as many of those from which these objects had been made, merely with implements of stone. It was also believed that such a people, even if possessed of large, thin plates of copper, could not have cut them into patterns so elaborate, the lines of which were often as curved and complicated, yet as clean as scroll, or stamped-work. It was therefore suggested, in the discussion which fol-

lowed the presentation of Mr. Moorehead's paper, that these objects were perhaps of European manufacture; or, granting the artwork on them to have been native, that the copper plates from which they had been cut must have been of foreign make, since such large thin sheets of metal could only have been wrought by means of rolling mills or stamping machines of hard metal.\*

Having practically and thoroughly learned the art of metal-working as practiced by the Zuni Indians; having often seen and helped them make uniform plates as well as extremely thin sheets of copper and silver by alternate hammering and annealing; then grinding with sand-stone, first one face, then the other, to form uniform leaves of the metal, I joined in this discussion, representing that, whether foreign or not, none of the forms described by Mr. Moorehead were impossible of production by a people actually limited to the resources of the stone age, as the builders of these mounds are known to have been. To this statement Professor McGee, in summing up the first part of the discussion, as presiding member, was inclined, from personal experience in metal-working, to agree; but it was objected by others that the mound people could hardly have possessed a

knowledge of annealing, so essential to the process of copper-beating, etc., as described by me. Thus the question was left indeterminate.

Being aware that the annealing, fusing and soldering or brazing of soft metals was known and practiced throughout a large area of the South-west prior to European contact, I did not question that annealing, at least, was also known to the mound-builders. Methods of pre-historic metal-working in the South-west, with examples of which I am acquainted, may be briefly referred to in this connection. I have found evidence that ore rich in scales or seams of copper too minute to be useful in the native state, was there quarried, and first roasted in an open fire, then baked, so to say, or partially smelted in a kind of subterranean funnel-shaped oven-furnace or kiln (Fig. 1) terminating at the base in a round, nearly flat-bottomed pot or relatively small pocket (Fig. 2). Smelting in this kind of furnace or kiln was accomplished by introducing only a small quantity of the ore at a time, surrounding and covering it with fuel; firing and replenishing the latter until fusion resulted.† On cooling, the mass of cinders, slag, etc., was raked out, and the copper or other metal culled from the pocket at the bottom of the kiln, where it

\* Rolling mills were not used until during the Seventeenth Century, in the latter half of which they were introduced into England from the Continent.

† On reading this manuscript to my learned friend, Mr. Walter William Palmer, a mining engineer of many years experience in Mexico, he informed me that the Indians of the sierras in Sonora and other parts use semi-subterranean ovens almost precisely like those discovered by me in the Salado valley, and that in smelting with these furnaces very dry twigs of greasewood only are used as fuel, the fire being closely watched and evenly replenished until fusion takes place. In this way they smelt even the sulphur ores of copper and silver with entire success. The presence of greasewood charcoal in the Arizona furnaces may therefore be taken as fair evidence that they were used, as I have suggested, for reducing ore.

occurred in buttons or irregular nodules. I have examined and excavated several such prehistoric oven-furnaces as above described and figured, especially near ancient copper quarries or pocket mines on the Southern border of the Salado Valley, Arizona. Except that they invariably possessed terminal pockets and contained an excess of slag and charred greasewood, they in no wise differed from the many true ovens found in the same region in connection with the ruined pueblos of the contiguous valley-plain. In fact, it may be conceived that the crude art of smelting here referred to might easily have been discovered through the earlier practice of the Pubelo people of preserving food or render-

a portion of the Zuni mountains, several stones showing traces of clear copper. Making a large fire in a hollow (dug there in former times by Indian turquois miners), I cast the rocks into the middle of it, gradually increasing the fire until the stones were aglow with heat, and, keeping it up for some hours, allowed it to die down. Afterward, on raking the embers and ashes away, I discovered several small buttons of copper. This almost natural kiln was far less perfect than the primitive oven-kilns above described, yet the experiment was a demonstrative success.

The primitive Pueblos worked nodules of copper thus obtained by alternate hammering and annealing. There is evidence fur-

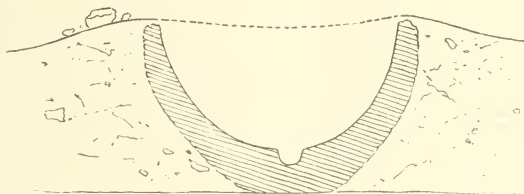


FIG. 2. — Section of ancient furnace, undisturbed.

ing green-corn, mescal, and various roots palatable, by means of stone-baking in great underground oven-kilns. Even in the food-kilns near the ruins, used apparently only for cooking, the heat was sometimes so excessive, that, combined with the natural alkaline flux of the soil in that region, it caused stones (although specially chosen for their comparative infusibility) to fuse into large, slag-cemented masses.

In order to test my archaeological observations and some vague Zuni traditions regarding this method of reducing ore, I once gathered, while traveling through

ther than this, that the more advanced of these peoples, whose Southerly remains I exhaustively investigated while conducting the Hemenway explorations, were possessed of a knowledge of hardening copper with silex introduced by a combined process of manipulation and annealing; that they sometimes fused together very small buttons of copper over hollowed stones to form ingots or slugs for their larger hammered work, although they do not seem to have cast other objects; and that they understood what I may term ember-brazing, whereby separate small parts of ornaments

and bells were joined together without the aid of fusible alloys or solder. Studying specimens indicating all of these processes, I began, while still in Southern Arizona, and have since carried to successful conclusion, experiments in them all, with purely primitive appliances and resources like those common to stone-age peoples, and in the open field only. In other words, limited by stone-age conditions and surroundings, I have succeeded in hardening copper by the introduction of silex as described, in casting ingots by fusing the metal in an open fire over grooves cut in a flat concave stone, and in joining small bits of stone-hammered copper, both by ember-brazing, as I have called it, and by rivet-hammering or a sort of metallic interlacing with filaments or rivet-like bits of metal. Once understood, all of these methods of metal-working are extremely simple so long as the operator confines himself strictly to the use of stone implements, etc., for most of these methods were discovered through such usage, and, indeed, *entire* success in them seems to be dependent thereon.

I have here parenthetically introduced the subject of South-western metallurgy, which I shall further treat of in a later paper, in order to call attention to facts not generally known or believed, and to evidence how far the most advanced of our aborigines north of Mexico had carried the arts of metal-working with means at their disposal as limited as were those of more Northern and Eastern peoples.

In the simple hammering, grinding, embossing and cutting of

native or of nodular copper as suggested by the mound specimens in question, I have also made experiments, the partial history and results of which may properly be more fully recorded here as bearing upon the above-mentioned discussion relative to art remains from the mounds of the Mississippi and tributary valleys, as well as on the problem as to whether or not the contents of these mounds could have been of purely aboriginal design and of stone-age production.

In these experiments I have been guided alike by my experience in working silver according to the methods of the Zunis, and by my practical knowledge of other arts as practiced by them and other Indians.

It is safe to assume, as a general proposition, that no new art was ever practiced by aboriginal Americans as strictly *new*. No art, I mean, in the working of new or unaccustomed material, which was wholly uninfluenced by arts and methods which, in connection with other materials more or less like the new material, had been practiced before. Thus I am led, by the experiments related below and by other considerations, to suppose that the simpler of the aboriginal arts in metal were at first influenced by more than one antecedent art, namely, not only by various methods of stone-working, but also of bark-working, skin-working, horn-working, etc. That the characteristics of the softer metals and the Indian's conceptions of, as well as his uses for them, would naturally associate them with such materials (and thus with their manipulation) need not be



specifically demonstrated; yet, as illustrating this and at the same time indicating the antiquity of metal-working in the South-west, some Zuni names of metal may appropriately be analyzed in this connection.

*He-we* is the general term for metal. It is derived from *he-sho*, wax, pitch, or resinous gum (*he* signifying wax-like in the sense of being fusible or rendered fluid by heat), and *a-we*, stones — “fusible-stones” or “fusible substance of stones.” The Zuni name for the copper of commerce is, however, *te-si-li-li he-we*, “ringing vessel metal;” their names for native (unalloyed) copper is *he-shi-lo-a-we*, pitch, or fusible red stuff of stones. This indicates not only that copper was known to the Zuni ancestry before its introduction by the whites (in the shape of vessels, etc., so well made as to ring), but also that it was discovered, probably as I have heretofore suggested, not in native masses but as a substance fused, at first accidentally from stones, and was hence named practically “the gum or pitch of stones;” and it also indicates that copper was conceived of as a kind of stone or stone material, yet as partaking in color as well as consistency (modifiability) of the qualities of pitch or waxen substances, such as the fire-cement for lacquer-like work, made of pitch and the gum of the greasewood (*Larrea mexicana*) and used for coating baskets, inlaid work, etc. As the words descriptive of raw or moistened skin, horn, etc., when in the state of softness induced by heat, also refer to this

wax-like quality, it will be seen that the association extended still further. This, too, is shown by another term as applied to sheet-metal, which, when very thin, is alluded to as *ke-pis-si-ne*, or “skin-thinned,” precisely as a thin plate of horn or a hammered piece of parfleche or rawhide would be; and it will be seen presently that the processes of working skin to make it thin, yet stiff and flat, as well as for shaping and embossing it in this condition, were applied or might have been applied almost directly to the working of malleable and annealed or fire-softened metal in sheets.


If, then, it may be reasonably inferred that the mound-builders were possessed of a knowledge of annealing, the significance of these facts and of my experiments as in part suggested by them, will be made more obvious. That the mound-builders must have been possessed of such knowledge may be inferentially assumed from the above, and is still more strongly evidenced in other ways.

1. In the working of shield-hide, parfleche, and horn, as well as in the straightening of arrowshafts or the bending of saplings, not only was heating (practically suggestive of annealing) constantly resorted to by almost all Indian tribes, but also by the use of perforated horn or bone plates and burnishers of horn or bone (themselves worked by fire-softening) in these simple arts, the essential properties of the draw-plate and burnisher for metal were discovered long before metal itself was.\*

\*Draw-plates made from the scapulae of deer were formerly used by Zuni and other Indian metal-workers of the Southwest in forming silver and copper wire from slender hammered rods

2. In the seventeenth century tribes on the Ohio were found still using small rude rods of copper for piercing pearls, horny substances, wood, etc., by heating them to redness and thrusting them through the objects to be perforated.

3. Numerous mortuary altars have been found in the older mounds covered with articles of copper which, having been sacrificed in fire, were fused together in many instances, and in some cases were so thoroughly melted as to form almost homogeneous masses.

4. It is not a little surprising that those who have supposed these ancient copper-workers of the north were confined to cold hammering, have not reflected that fire was used in nearly all the Lake Superior mines or quarries, whence the copper was chiefly derived, in the same manner as at Flint Ridge and in western New York in the quarrying of flint from limestone, for the removal of copper from its rocky matrix. Fire also was occasionally employed to burn away or disintegrate small portions of rock when found adhering to boulder or drift copper, as shown by a specimen I have seen from Wisconsin. 

It seems to me improbable, indeed inconceivable, that a people using fire in connection with copper and the working of similar

materials in so many ways as these, should not have become acquainted almost at the outset with its value for softening (as well as in at least partially reducing) metal, even had not the liable accidents of daily life in the use at first of cold-fashioned articles of the latter material made them acquainted with these properties.

In copper-working, then, to reproduce with stone-age appliances the objects under discussion, and thus to ascertain whether they were prehistoric, and, if so, to relearn the actual methods by which they were made, I have not hesitated to freely use fire for softening my slugs and plates of metal; and in drawing out sheets by hammering with stone bowlders or mauls I have, for like reasons, simply employed the methods used by the Zuni and other Indians in hard-dressing skin, horn, and like modifiable materials.

When these peoples thus dress a piece of rawhide they lay it upon a very smooth, flat, but rounded boulder (of diorite usually) and "rub-hammer" or hammer it slantingly ("coaxingly," the Zunis would say) from the center outward, thence from the peripheries inward but always by oblique strokes tending outward. Now, I find that a piece of copper or other soft metal thus treated,

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of those metals. The holes in these draw-plates were very numerous and nicely graded from coarse to fine, and wax mixed with tallow was freely used to facilitate the passage of the rods through them. The rods were not, however, unless very slender, drawn through merely, as in our corresponding operation with the steel draw-plate, but were passed through by a combination of pushing and pulling, accompanied by a twisting motion, just as arrow-shafts are rounded and straightened in a perforated horn plate. That these bone draw-plates were the direct descendants of the perforated horn arrow-straightener cannot be doubted. I am told that the Sierra Indian filagree-workers of northern Mexico also use such plates, made from the scapule of sheep, and with a like bone implement I have myself succeeded in making copper wire as fine as coarse linen thread.

rapidly spreads, behaving somewhat as the rawhide does. When a maul with a slight, but very firm grain is used (a maul of compact granite or quartzite, for instance), the rough face aids the thinning and spreading of the metal (until very thin) by displacing the surface molecules at a multitude of minute points, thus pitting the face of the metal and keeping it from becoming harder and more brittle than the mass or medial portion; thereby also the metal is toughened (since the blows fall always in different places), is not so rapidly hardened throughout, and is actually not so liable to scale or crack as when treated with a smooth-faced hammer of iron or steel. As soon as, in my experiments, I have in this manner reduced a plate almost to the desired thinness, I have with a smoother stone (like the back or butt of a worn-out, well-polished diorite celt) supplied with a flexible handle, gone over both sides of it to reduce all the larger irregularities and to partially smooth the surface where pitted by the coarser maul. This may be done partly by hammering, partly by combined rubbing, pressure and rolling with a smooth, unmounted boulder. I have then proceeded precisely as an Indian would in dressing down the flesh side of his hammered sheet of parfleche. I have taken flat-faced pieces of fine sandstone and, laying the sheet of metal on a firm, level spot, with a buckskin underneath to act as a buffer and also to help hold the plate in place, have ground, then scoured, first one face, then the other, until uniformity of surface and of thickness have been secured.

It happened that in some of these experiments places which had been accidentally grooved or indented in the sheet by the corner of my rubbing stone, or otherwise, when it was turned over and carelessly ground on the other side were worn or cut through. This taught me what I had before suspected, both from the study of skin-working and from very natural inference, that the sheet-metal, even when thicker than that of which the ancient



FIG. 3. — Ancient sheet-copper eagle figure from an Illinois mound.

specimens usually found in the mounds were fashioned, could be cut into any form or perforated in well-nigh limitless variety of pattern by pressure-grooving, repousse, or line-embossing from one side or surface, and by grinding across the resultantly raised lines of the other side or opposite surface; and in this further development of the experiments I as constantly resorted to methods in vogue among Indians to-day for embossing skin, etc.

For instance, in one of my experimental efforts to reproduce the celebrated sheet-copper figure of an eagle (Fig. 3) found many years ago by Major Powell in a mound near Peoria, Illinois, I first prepared my plate of metal as above related and softened it by heating to redness for several minutes on a brisk ember-fire. When cooled I lightly traced the outline of the figure on one face of the metal plate, and placed the latter, with tracing uppermost, on a yielding mat of buckskin, folded and laid on a level, hard spot of ground. Then I took a long,

with it. Moderately deep and remarkably sharp smooth grooves were thus plowed or impressed in the ductile metal wherever the horn point had traversed it, except along upward curves and around sharp turns or where hard places happened to occur in the plate. In order to deepen the grooving at such points as these, I found that it was only necessary to use a rounded chisel made from the humerus of a deer, like an Indian skin-flesher of bone. This, firmly grasped and pressed by the hand alone, then rolled or rocked to and fro, served admirably to



FIG. 4.—Method of grooving copper plate with horn embossing tool preparatory to severing.

pointed tool of buckhorn and, adjusting the butt of it against my chest and the point to the design, pressed downward with as much of my weight as was needful to make it sink slightly into the metal (Fig. 4), and, continuing the pressure evenly, went over all of the longer lines of the tracing

deepen straight grooves to any extent desirable, or, if twirled while it was being pressed down and rocked, to impress or deepen curved lines (Fig. 5).

When all the lines of the design had been completed by these combined processes of pressure-drawing with the horn tool and pres-



sure-rocking with the bone tool, the plate, on being turned over, exhibited in clearly raised outline the reverse of the pattern I had traced and thus embossed. On grinding these sharp ridges cross-wise with a flat piece of sandstone (Fig 7, C) their apices were speedily (within seventeen minutes) cut through, and the eagle

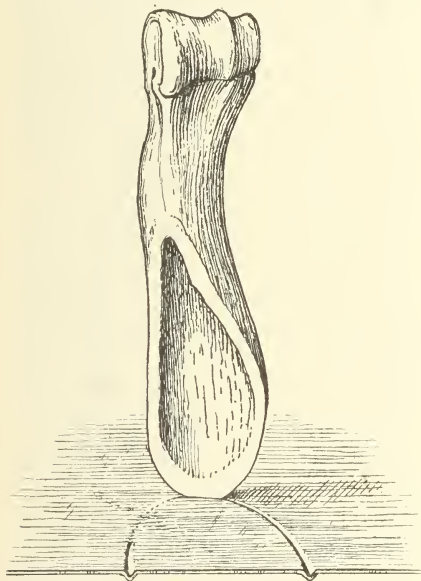


FIG. 5—Method of grooving copper plate by pressure and rocking motion with bone chisel.

form as outlined by the embossing (Fig 7) was thus completely severed from the plate, leaving the portion from which it had been removed like the open space of a stencil.

In subsequent experiments I discovered many additional processes, and developed improvements on the earlier ways of working. Perhaps the most significant of these latter was the employment of part-patterns (cut out of firm, yet slightly flexible rawhide by identical methods) as guides for figures of bisymmetrical outline, such as are so often found in the mounds. By firmly holding one of these half-patterns flat against the plate to be embossed for cutting out, then running the horn point around it to strike-in one side of the design, reversing the pattern and continuing the embossing operation for the other side, an outline at once intricate, and of course bilaterally symmetrical, could be almost as rapidly struck-in as could be the simplest device. Such outline could also be repeated any desired number of times.

[To be concluded.]

## AN ACCOUNT OF THE SIOUX GHOST DANCE.

ELAINE GOODALE EASTMAN.

In the month of July, 1889, I joined a party of Indians with whom I had long been acquainted, and set out with them upon a deer-hunt in the sand-hills of Nebraska. My object was to establish an intimacy which would permit me to learn more of their peculiar customs and habits of thought, and to

this trip, which covered a period of ten weeks, I owe much of my knowledge of the Sioux.

We camped the second night on the banks of a wooded creek between the Lower Brule and Rosebud Agencies. Supper was over, the beds in the several tents arranged, the camp-fires were burn-

ing low, and silence was about to descend upon the weary travelers, when the rapid hoof-beats of a horse ridden at full speed toward us caught the quick ears of the Indians, while at the same time several of the dogs began to bark. In a moment all were wide awake, and all, except myself and the sleeping children, turned out to greet the solitary horseman who proved to be an acquaintance on his way from one Agency to the other. Of course he dismounted; the embers of the fire were rekindled, the coffee re-heated, and a second meal prepared, while through the thin walls of my tepee, I listened to the exchange of question and gossip. But on this occasion it was not ordinary gossip. The visitor was full of an extraordinary story which he had just heard at Rosebud, and as he told it with the air of great sincerity, his auditors became as much excited as himself. "There are some Indians in the Northwest," he said, "to whom the Son of God has lately appeared. He stood before them as a beautiful young man, with waving yellow hair. He told them that he was weary of the crying of the parents for their children, who had died of want and strange diseases. So monotonous had this constant wailing become in his ears, that he was about to let fall a portion of the heavens upon the earth and to destroy the people." Our party was evidently much impressed by this story, and discussed it most of the night, and for several days afterward. Then, having made a note of it in my journal, I heard of it no more, and had almost forgotten the circumstance when, nearly a year a later, the

similar tales repeated at Pine Ridge Agency, and the inception of the Ghost or Spirit dances, recalled it to my mind.

The four men from Pine Ridge Agency, who travelled to the land of the Shoshones, or beyond, in search of the Messiah, and who returned with marvelous tales to fire the imaginations of the people, were Short Bull, Good Thunder and Yellow Breast, all Sioux, with Porcupine, a Cheyenne. I have the story as it was told by Good Thunder to my Indian driver, and taken down on the spot. It is as follows:

"With three others, I travelled three years to see the Christ. We crossed many Indian reservations and passed through the white man's towns. On a broad plain covered with Indians, I saw him at last. I could not tell where he came from—suddenly he appeared to me—a man of surpassing beauty with long, golden hair—clad in a blue robe. He did not look at me, nor speak, but he read our thoughts and answered them without speech. I saw the prints of the nails in his hands and feet.

"He said that he had come upon earth once before—he had appeared to the whites and they had scorned him and slain him. Now he appeared to the Indians. He said that the crying of the Indians had sounded loud in his ears—they were dying of disease and starvation; dying of the white man's food and his strange ways. He was come to save them. He had meant to come in three days, (meaning years) but the cries of the poor Indians moved his pity. He would therefore come to them to-morrow (meaning next sum-

mer). He would then gather together the souls of the Indians, and they would be in Paradise, hunting the buffalo and living in skin tents as in the old days. The souls of murderers and thieves, however, must wait for some time in outer darkness.

"The Indians offered Christ a pipe, tobacco pouch and moccasins—he handed the two first to others who were with him, but kept the moccasins. Three birds, the eagle, dove and hawk, attended him."

Here is no mention of any order concerning the Ghost Dance, yet the followers of the new Messiah claimed to have received from him the essentials of their peculiar worship. From about May, 1890, it spread rapidly among the people. Short Bull, Kicking Bear, Big Road, Little Wound, Jack Red Cloud, and others, were leaders and prophets. The stories told about the Christ, and the ceremonies of the dance, varied greatly in different quarters. Countless lesser superstitions grew out of the original and consistent one, thus laying the whole matter open to ridicule. Nevertheless, the excitement grew, and the flame was doubtless fanned by the futile attempts of the Agent and police to put it out. Fanaticism thrives on persecution.

I saw the Ghost Dance by moonlight on Porcupine Tail Creek in November. At this time I described it thus in my journal:

"They clasp hands, or rather interlock fingers, and dance round a tree planted in their midst—the 'sacred tree'—singing peculiar songs, alternating with

loud crying and prayers or invocations by the priests. The words of one chant are:

Heciya wanasape kte do (three times).  
Ate heye lo (twice)

*(There we shall hunt the buffalo  
Our father has said it.)*

"No fire or light is allowed. They dance, fasting, after passing through the 'sweat lodge,' or Turkish bath. Men, women and children join. Some fall into a trance or faint, after rushing blindly about for a time, and are then said to die and go to the land of spirits, when they meet and recognize all their companions who have died. They are living in a most beautiful country, covered with buffalo and all kinds of game. They dwell in skin lodges, dressed in garments of tanned skins, playing all the old games, and are perfectly happy. When the dreamer returns to earth everything looks gloomy and horrible to him, and he weeps long for paradise—eager to die in reality and go to be with his friends.

Sometimes 'wanagi tawasna,' (the dried buffalo meat of the spirits) is brought back with them and a handful suffices to feast the whole company. Shirts painted and adorned in a symbolic manner are worn at the dance."

Many more details might be given, but this will indicate sufficiently the nature and outward manifestations of the new faith. Its origin is an unsolved mystery.

During the autumn of 1890 it became evident that a large number of the Sioux—perhaps one-third—had become seriously affected by this peculiar religious

craze. Its ceremonies occupied them to the neglect of their schools and farms. Nevertheless, the children were not withdrawn from the schools; church services were still attended with but slight diminution of numbers, and there was, I believe, absolutely no indication of war-like intentions or of any conspiracy against the whites. In November, without warning or apparent motive, U. S. Troops appeared at the principal Agencies, and immediately, as might have been expected, the existing excitement was augmented ten-fold, and indeed, took on quite a different and more alarming aspect. The dancing became constant and frenzied, the leaders outwardly defiant — and yet there were more signs of distrust and fear than of any sinister purpose. It was a time of confusion and vague terror among these poor people — a terror which reached its climax and apparent justification in those two disgraceful episodes of our late forced “campaign,” the slaughter of Sitting Bull and his followers, and the indiscriminate carnage at Wounded Knee.

The story of Wounded Knee has been told many times — I now propose to tell it briefly from the Indian standpoint, as personally gathered from the reports of survivors, by my husband and myself, and as indicated by the aspect of the battle-field after the struggle was ended. A party of Cheyenne River Indians, about 250 in number, of whom Spotted Elk, nicknamed Big Foot, was chief, were on their way from their village to the Agency to draw the month's rations, when they were met by an Indian scout, who told them of the late encounter with Sitting

Bull's band, and directed them to return for a council with “Three Fingers” who would, he said, issue rations to them at once. They, accordingly, turned back and camped for a night, with the troops under Capt. Carr. He told them to proceed the next day to their village, where he would talk with them. On the way, however, they met with the fugitives from Standing Rock, whose pitiful story excited them greatly, and, toward evening, they were approached by a mischief making “squaw man” who still further alarmed them by the tale that they were to be attacked by the troops on the morrow. In a hasty council it was determined to set out at once for Pine Ridge Agency, where they had heard that many of the Indians were gathering, and whither Red Cloud had already summoned them. It was nearly sundown when they hurriedly struck their tents, and secretly departed.

About two hours before they met the troops under Captain Whiting, who had been sent out to intercept them, and while on the Porcupine Tail highway to Pine Ridge Agency, they were informed by scouts of the approach of the soldiers. They, however, went quietly forward and met the troops near the Porcupine Tail Butte. As soon as the two parties came within sight of one another, the military drew up in battle array, and placed its Hotchkiss guns in a commanding position. Still the party advanced, men, women and children; and although some of the young men were a little excited by this formidable display, the older ones counseled them to be quiet and all



approached and shook hands with officers and men. In the meantime the cavalry formed a hollow square surrounding the Indians, and they went on in this manner to the Wounded Knee Creek, where they camped in a sort of natural basin, the guns being planted on a little knoll and the troops still completely surrounding their virtual prisoners, who were fed and told that a council would be held in the morning.

The sad day of the 29th of December dawned upon the little encampment in a hollow of the prairie. I wish that I could tell what followed in the exact words — so harrowing in their simplicity — of some who barely escaped with their lives. It appears that, after some talk, the Indians were ordered to surrender their arms. Fearful of what this might mean, and jealous of their only means of defence, they hesitated, but did not refuse. The men were sent in detachments of twenty to their tents for guns, and returned bringing only a few. Then the men were guarded and the tents searched by soldiers detailed for that purpose. The women say that the knives which they all carry for domestic purposes were taken from them, except in the case of a few who had time to conceal them under their clothing, and even the hatchets for cutting fire-wood were confiscated. About forty guns were now collected. (Remember that there were only about 100 men in all, including old men, and boys over fourteen).

The commanding officer was not yet satisfied. The order was given to search the persons of the men. This was too much. Al-

most immediately, and without sign of premeditation or of a general attack, a hot headed youth pulled his gun from under his blanket and fired. Some say that another shot followed, but it is not known whether these shots took effect. It is certain that the instantaneous reply was a death-dealing volley from the rifles of the soldiers. Some of the Indians made a dash for the tents to secure concealed weapons — some snatched guns from the pile of confiscated arms — some fought with their knives and clubs, and some, unarmed and helpless, who had already surrendered their guns and were sitting on the ground, smoking, at the moment of the first resistance, fled up the nearest ravines in the bare hope of saving their lives.

After about half an hour of this desperate struggle, the smoke cleared, and disclosed the bodies of more than half the men, lying where they had stood, almost touching one another — the women and children, with the remnant of the men, flying in every direction, but chiefly seeking shelter in the ravines. The fight now became a hunt, and mothers with babies on their backs, little girls and boys, aged women and unarmed men were ferreted out and shot down singly and in groups with merciless brutality. The position in which the bodies of forty-five women and children were found, and the nature of the wounds, powder-scorched in some cases, prove the facts beyond a doubt. A woman tells of escaping with her two little ones, to a gully at some distance and meeting there another fleeing mother, also with her children, they hid together

behind a fallen tree. Suddenly they heard cries and the sound of horses' feet. Two soldiers were approaching their hiding place. Panic-stricken, the second woman left her retreat and fled toward a hollow where she fancied she might conceal herself and her children more completely. Several shots followed and told the other, cowering in her place, what she afterward verified in seeing the three dead bodies side by side.

I have been asked to give my opinion of the events narrated. I think that the hope of a Savior for the Indians, sprang primarily from the misery of the people—from hunger, disease and growing want. Doubtless its chief prophets were disingenuous, and the wily chiefs, such as Sitting Bull and Red Cloud, who favored it, did so for reasons of their own, but I believe that the mass of poor creatures who joined in the Ghost Dance, sincerely looked for supernatural aid. Many who accepted "the new religion" were already impressed by the Christian story, but still felt that Christianity had not been presented in a manner to win their full sympathy. To them it was "the white man's religion;" they wanted a Christ of their own—a worship adapted to their peculiar ideas and customs. What could be more natural, or, rightly viewed, more deserving of pity and respect?

I do not think that the "Ghost Dance," although it interfered for the time with civilized pursuits, to a limited extent, threatened any immediate danger to the whites. I believe that it should have been dealt with indirectly, by removing, as far as possible,

all causes of complaint and suffering, and not directly forbidden. Fair and kind treatment from the whites, increasing prosperity, and the non-appearance of the promised Messiah at the time appointed, would, in all probability, have caused this Ghost Dance to die a natural death within a few months. Violent opposition only increased its fervor and superstition; a burning sense of wrong, and a vague terror all combined to bring on the crisis.

There was no "outbreak." There was merely on two occasions, a blind and unpremeditated resistance to acts which were regarded as tyrannical and whose consequences were greatly feared. I am satisfied that Big Foot's band, which suffered at Wounded Knee, was unprepared and unwilling to fight. Indians are far too shrewd to place themselves at such a tremendous disadvantage when a conflict is anticipated. They could have avoided the troops altogether by making a detour to the Bad Lands—they could have surprised the camp in the night, or they could have made a determined stand when their arms were demanded, and opened hostilities without the loss of a single weapon. No—the mad act of the one hot-headed young man precipitated that fearful slaughter, of which the disgraceful and unpardonable feature is the deliberate destruction of flying non-combatants. This murder and mutilation of helpless babies and women, is equal to anything recorded of savages, and must remain a shame to the United States Army.

I regard then, in a word, the whole conflict as unnecessary and

worse than useless; its chief event as disgraceful to our humanity, and the general result as most unfortunate. There was no real conquest — no genuine submission — nothing is settled permanently — not even the “Messiah worship.” It is certain that many still secretly believe in its efficacy, since it was stopped by violence and not suffered to disprove itself.

There has been a marked revival of Indian dress and customs — of some of the more objectionable customs since the winter of 1890-91. There is no security against a second and more serious disturbance of the peace — indeed I think that a “Sioux War” at some future time, is altogether more likely now than it appeared just three years ago.\*

## OBSIDIAN OR VOLCANIC GLASS.

WILLIAM W. RALSTON.

This peculiar glass-like stone is of volcanic origin. The ancient Mexicans made use of it extensively in the manufacture of implements and ornaments, before the empire of the Aztecs succumbed to the Spanish invaders. Some of the old obsidian mines are still to be seen on the Cerro de Navajas, a small mountain north-east of the City of Mexico. These mines provided the ancient population with large quantities of the much-prized stone from which they made those fine double-edged knives, the arrow and spear-heads, mirrors, and ornaments of various kinds. It is said by one of the old authorities that the soldiers of Cortez used these long, slender, and double-edged blades to shave with. However this may be, they are certainly very keen and will hold an edge a long time.

Mr. E. B. Tylor, an English ethnologist, who visited Cerro de Navajas in 1856, says: “Some of the trachytic porphyry which forms the substance of the hills had happened to have cooled,

under suitable conditions, from the molten state into a sort of slag, or volcanic glass, which is the obsidian in question; and, in places, this vitreous lava, from one layer having flowed over another which was already cool, was regularly stratified. The mines were mere wells, not very deep, with horizontal workings into the obsidian where it was very good and in thick layers. Round about were heaps of fragments (hundreds of tons of them) and it was clear, from the shape of these, that some of the manufacturing was done on the spot. There had been great numbers of pits worked, and it was from these *minillas*, little mines, as they are called, that we first got an idea how important an element this obsidian was in the old Aztec civilization. In excursions made since, we traveled over whole districts in the plains where fragments of these arrows and knives were to be found literally at every step, mixed with morsels of pottery, and here and there a little clay idol.”

\* The editor's note on the Messiah Craze, Ghost Dance Music, etc., will follow in the May number.

The following communication by Dr. C. H. Berendt, from one of the Smithsonian Reports, is exceedingly interesting :

“ During one of many excursions which I made in the years 1853-56 around the Citlaltepētł, or Pico de Orizaba (in the State of Vera Cruz), I saw an obsidian mine upon the western slope of that mountain. I had heard of it from my friend, the late Mr. C. Sartorius, who had visited the place years ago. I was informed that the Indians of the village of Alpatlahua knew the place, but that they did not like to have it visited. Some say they have treasures hidden in the caves of the neighborhood; while others believe that they have idols in those lonely places which they still secretly worship. The cura of San Juan Coscomatepec, who was of the latter opinion, gave me the name of a mestizo farmer in the neighborhood who might be induced to show me the place. Our party followed from Coscomatepec the road which leads to the Rancho Jacal and the pass of La Cuchilla. We did not find the mestizo at home, but his wife, who directed her boy to show us the cave. Reaching the bridge of the Jamapa River, we took a by-road parting to the north, which brought us to the village of Alpatlahua, and about four miles farther north to a branch of the Jamapa river, which we crossed. We then left the road and proceeded about half a mile up the river through the thick woods, when we found ourselves suddenly before the entrance of the cave. It was about fifty feet high and of considerable width, but obstructed by fallen rocks and

shrubs. Heaps of obsidian chips of more than a man's height filled the bottom of the grotto, which had apparently no considerable horizontal depth. To the left of the mine was seen an excavation of from six to eight yards, the bottom filled with rubbish and chips. Obsidian, evidently, had not only been quarried, but also been made into implements at this spot, the latter fact being proved by the occurrence of cores, or nuclei, of all sizes, from which flakes or knives had been detached. We were not prepared for digging, and it was too late to undertake explorations that day. So we left, with the purpose to return better prepared at another time, hoping to find some relics of the miners and workmen, and, perhaps, other antiquities. But it happened that I never had another opportunity to visit the place again. Mr. Sartorius saw in this cave three entrances walled up with stone and mortar, but these I did not discover, having, as stated, no time for a careful examination. Future travelers I hope will be more successful.

“ Mr. Sartorius mentioned another place, likewise in the State of Vera Cruz, where obsidian formerly was quarried. This place is situated in the chain of mountains extending from the Pico de Orizaba to the Cofre de Perote. One of the intervening mountains, called Xalistac, is distinguished by a white spot that can be seen at a distance of many miles, even at Vera Cruz. It is produced by an outcropping of pumice-stone resting upon an immense mass of obsidian that has been worked in various places.



I know the mountain well, but not the road leading to it, never having traveled in that direction."

Captain Bonneville noticed, about sixty years ago, that the Shoshones or Snake Indians in the neighborhood of the Snake River used arrows armed with points of obsidian, which, he adds, abounds in the vicinity. The latter fact is confirmed by Samuel Parker, who found some years later (1835) in the volcanic formations of that region, "many large and fine specimens of pure obsidian or volcanic glass." According to Wyeth, the Shoshones also employ sharp obsidian flakes of convenient shape as knives, which they sometimes provided with handles of wood and horn.

It is known that the various tribes in Arizona, New Mexico, and California, including the Apaches, Mojaves, Yumas, Shas-tas, and others, frequently employed obsidian in the manufacture of their arrow-heads.

Obsidian occurs also in the Napa Valley (north of San Francisco) where the surface is covered in many places with chips, cores, and fragments to a depth of from six to twelve inches.

The greatest outcropping of this volcanic substance within our borders is to be found on the Yellowstone River in what is now the Yellowstone National Park. Here a part of the driveway has been built of this material, and it has been ground so fine by constant travel, that it assumes the appearance of a hard, macadamized road.

Comparatively little obsidian has been found east of the Rocky

Mountains. Messrs. Squier and Davis in 1849 found obsidian in the shape of points for arrows, spears and knives, mostly broken, in five mounds of the Scioto Valley of Ohio. Scattered pieces have been found in other States east of the Rocky Mountains.

By far the greatest and most important discovery of this material in the East was made in the Fall of 1891, by the World's Columbian Exposition Survey engaged in the exploration of mounds and earthworks in the Scioto Valley of Ohio. Here a group (the Hopewell Group) of twenty-seven mounds was excavated and examined. While taking out the largest mound of the group, which was 23½ feet high, 510 feet long, and 210 feet wide, a clay altar was exposed containing, among many other rare finds, several hundred specimens of beautifully chipped obsidian implements comprising knives, lance, arrow, and spear-heads. Several of these were from ten to thirteen inches in length, and others were curved like a scimitar. A great many, however, were charred and broken by the fire that had been built over the altar. No cores, chips, or unfinished pieces were found, which leads to the belief that it was manufactured elsewhere and brought here either by trade or travel—probably from the ledge on the Yellowstone River; possibly from Mexico. Undoubtedly much more of this material is to be found in the numerous unopened mounds of the Ohio and Mississippi Valleys.

It is useless to indulge in speculations as to which of these localities—the ledge on the Yellow-

stone, the country of the Shoshones in the neighborhood of the Snake River, or the previously mentioned mines of Mexico—this volcanic substance found in the Scioto Valley (a valley occupying the central portion of the State of Ohio), was derived. Yet, the

very fact of finding worked obsidian at such great distances from the places where it occurs *in situ* is important, as it furnishes an additional illustration of the far-reaching communication among the aborigines of North America.

### CARVED SHELL.

[Found in Hardin County, Ohio.]

JESSE SNODGRASS, M. D.



During the Glacial epoch or Ice-age many gravel deposits, hills and ridges of pure gravel and sand were left over various parts of Hardin County.

In Taylor Creek Township, 4 miles South of Kenton, is a high gravel-ridge 4 miles in extent, known in Hardin County as the "Devil's Back-bone," ranging from 30 to 90 feet in height, of pure gravel and sand.

The largest part of 300 miles of our County pikes was taken from this ridge. Three railroads in the county have taken out many miles of ballast from this same immense gravel deposit. Dozens of human skeletons have been unearthed while digging out this gravel. Sacrificial altars and charred human bones and many

beautiful relics have been found.

No care was taken by those in charge to study the position and manner of burial, or whether relics had been buried with the remains; but occasionally, some workman accidentally discovered a peculiar looking stone, arrow-head, stone pipe, bird amulet, banner stone, slate ornament, beads, etc. No doubt many beautiful specimens have been lifted out by the huge steam shovel and carried away, never to be seen by human eyes. But notwithstanding this carelessness in regard to the finding of ancient stone and other implements, there are already more specimens saved in Hardin County, than are in the possession of the Archæological Department of the State of Ohio.

I think it a shame, that the great State of Ohio, richer in the remains of prehistoric people than any other state in the Union, does not take more interest in archæology, and give to the world the benefit of the knowledge which can and ought to be developed.

As I said before, many gravel hills or mounds are located in various portions of Hardin County. On the farm of Mr. William Spitzer,  $3\frac{1}{2}$  miles north-east of Kenton, there is a gravel deposit probably 8 or 10 rods long and 3 wide. The County Commissioners selected and bought this gravel for pike purposes. About the 10th of August, 1886, the workmen digging and shoveling, unearthed several human skeletons. There were also found in this gravel several slate ornaments, banner stones, arrow-heads, etc., and among the gravel and bones a carved shell, of which a piece was broken off, supposedly by the shovel or pick; no care was taken to look for the broken piece, but as the shell was novel in having carving on it, the finder took it home, and accidentally seeing it one day I modestly asked for it and it was given to me. I am unable at present to give any further history of the find.

I had the shell photographed and showed it to Mr. Moorehead last summer, while visiting the Archæological Department at the World's Fair.

I thought it would be interesting to the readers of the "ARCHÆOLOGIST," so have had this illustration taken from a photograph, that the peculiar shape of the animal represented in the carving might be seen. What kind of an animal it was to represent I do

not know, although my impression is that it was probably intended to represent a bear. However, the long tail reaching over the body would dispossess that idea. Probably it represents some prehistoric animal. However that may be, I think the specimen decidedly unique and wonderful; and how carving could be done on such hard material as shell, without steel instruments I cannot understand.

In front of the animal's head are plain and visible tracings of the instrument which was used to carve with; little notches in the mouth to represent teeth are visible; both eyes are on one side as represented in illustration and little depressions are hollowed out in the ears. The two fore-feet are not the same shape—two toes, as will be seen on one foot, while there are none on the other; two toes of the hind foot can just be seen where the shell is broken off; two small holes are drilled through the shell, one just opposite the hind foot and between the toes, the other just below it and partly broken out by the lower fragment. The eye-holes are not drilled through, but the hole in front of the eyes, is, as well as the one in the right hand upper corner, beneath which is what I suppose to be intended for a tail to the animal and which, you can see, runs along the upper border of the shell, ending directly over the animal's neck in a large bunch like a cat-tail; I mean the cat-tail that grows in swamps and marshy places, the *Typhalatifolia*. Thinking an account of this piece of ancient or pre-historic carving might be interesting to the readers of this magazine, I respectfully submit it.

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## EDITORIAL.

### The Literature of the Past Sixty Days.

A number of persons have remarked the great increase in archæological literature. Students have been fortunate, as no less than fifteen or twenty pamphlets and several important books have appeared since the middle of January.

The editor has given more than the usual space to Baron Nordenskiöld's book. No poor works have appeared this year. Usually there are half a dozen or more books and pamphlets, which are not worth reading, issued during the winter on the subject of

American archaeology. It is exceedingly gratifying that a high standard has been maintained in the publications which have appeared. There is every reason to believe that the excellent position will be maintained.

This number of the ARCHÆOLOGIST is issued from the press of a large publishing house in Columbus, Ohio. The office of the business manager will be at Waterloo, Indiana, and all business will be transacted from there as heretofore. Communications concerning articles and correspondence for the collector's department, should be addressed to the editor at Orton Hall, O. S. U., Columbus, Ohio. With the change in the printing of the journal we promise our readers that each issue will be out promptly upon the first of the month, and that no more vexatious delays will occur.

The various museum assistants report no particular news from Eastern or Western institutions. It is not positively known whether more than two surveys will be sent out during the coming year. Probably one of these will go to South America, and another may explore remains in Georgia and Alabama. The new department of Archæology at the Ohio State University will carry on limited explorations in Southern Ohio, and the results of the work will be published from time to time in the ARCHÆOLOGIST.



## PROGRESS OF FIELD WORK.

**Department of American and Prehistoric Archæology of the University of Pennsylvania.**

Further search for proof of Man's great antiquity in North America has led to an exploration, in November, 1893, of the chalk gorges in southern Texas, where rumor reported the discovery of human relics mixed with the bones of the Mammoth and Fossil Horse. But the alleged sites of hornstone, artificial chips and of human interments examined in the San Diego gorge, (Duval County, Texas,) belonged not to the fossil-bearing layers but to a talus, which, mingling modern surface loam with ancient underplaced chalk, has obscured the record of the freshet-torn ravine.

Further negative evidence, again illustrating the difficulties to be encountered in the search for human relics in the ancient layers of these parched water courses, was found in the deeper gorge of Indian creek, near Berclair, (Bee County, Texas,) which like that at San Diego, had in recent years furnished shelter and stagnant drinking water to roving Indian bands. Here artificial chips and fire-fractured stones falling from the loamy crest of a fossil-bearing bluff, lay not far from the teeth of the extinct American Horse in an indiscriminate talus below, while the clear, water-eroded cuts, exposing for more than a mile the stratification, (chalk and pebbles, marl and sand 6 to 18 feet and surface loam 2 to 8 feet,) showed no human relic in situ to prove that Man in southern Texas had ever been contemporary of the Mammoth, the Broad-Horned Ox and the Fossil Horse.

Turning again to the record of caves for the traces of Man as a possible predecessor of the Indian and contemporary of an older fauna in the Eastern United States, the dry, well-lit and easily accessible cavern of Lookout Mountain, on the left Tennessee river bank, below Chattanooga, was examined in December, 1893. Four trenches, 6 feet wide and 5 feet 10 inches to 3 feet

deep, dug twice to rock bottom across its floor, proved that Man had lived there. But they surprised us by showing the absence of distinct layers of occupancy separated by crusts of stalagmite, clay, sand and breccia, marking lapses of time between his comings and goings. Here, where the cave's shelter must have been forced upon the notice of primitive people by the narrowness of the river path and the height of the overhanging cliff, but a single bed of refuse, homogeneous throughout and showing no evolution in the form, material or grade of relics discovered, rested on the cave earth and limestone. No trace of "Paleolithic Man" or "Mound Builder," "Pigmy" or "Welshman" underlaid the familiar black band, 3 feet 8 inches at thickest, that betrayed the well-known maker of shell-mixed pottery, bone awls, chert arrowheads, shell beads, drilled sandstone and clay pipes. The Indian, as known to the white man discoverer, bringing with him a neolithic culture learned elsewhere, coming as high in the scale as he departed, and who had, as I found, laid the bones of his dead upon inner ledges of the cave and cast them dried and clean with arrowheads, potsherds and broken perforated gorgets upon mortuary fires in a subterranean chasm 250 paces from the entrance, had alone inhabited the cave.

Paleontology would assert no antiquity for his occupancy as judged by the 29 living and 2 extinct species of fauna found with the refuse. Some animals, traced by their bones in the fire places, like the Spade-Footed Toad, the Bat and the Tortoise, though the contemporaries or successors of the cave inhabitant, may have found their way into the midden heap to die, while the remains of the Unio, (7 species,) Trypanosoma and Paludina, (2 species,) and of the Catfish, Sucker, Drumfish, Land Tortoise, Water Tortoise, Soft-Shelled Turtle, Wild Turkey, Marmot, Lynx, Opossum, Squirrel, Raccoon, Otter and Deer, sometimes split and scorched, generally disassociated with teeth and but once showing traces of rodent

gnawing, inferred the hunter's capture of food in river and forest and his carrying of larger animal trunks decapitated to the cave feast.

A bone of the extinct Peccary lying in the refuse repeated the discovery made in Queen Esther's chamber of Durham Cave, Pennsylvania. But the teeth of the Tapir, (*Tapirus americanus*), kindly identified with all the other bones by Professor Cope, found by us in Section 5 (3rd foot) and close to the bottom of the layer of occupancy, added a new species to the list of (northwardly) extinct American mammals thus far observed in like association with human remains. Still we had not positively found that the Indian had this gentle South American animal in the mountainous region of the upper Tennessee, for 1 foot 9 inches of the original red cave earth remained undisturbed, and free of bones when examined, under the human refuse, and the Tapir teeth lying where found, near the bottom of the refuse and close to this lower red stratum, may have been imbedded in the latter before the Indian came, so that if he encountered them in scratching his wonted oven hole he might have mixed them with what was to grow by degrees into the present fire-blackened layer.

The awe-inspiring entrance of the Nickajack Cave, (left bank of the Tennessee River, Marion County, Tennessee,) though subject to partial invasion by river freshets that back the water of the cave creek several hundred yards into its channel, showed traces of aboriginal habitation as far as light penetrated. But the human refuse lay in a scattered talus on an uneven and craggy floor, about 250 feet wide, which, sloping steeply into the cave stream, was buried under masses of leached earth thrown upon it by nitre diggers in 1863-64. Where the remains of old fires were caught in hollows in the slanting ledge underlying this nitrous deposit, a trench (12 feet 10 inches long by 6 feet wide, by 2 feet 10 to 3 feet 5 inches deep,) revealed again a single

homogeneous layer of human occupancy continued on an undisturbed shelf clear of the nitre heaps and containing the remains of *Unio*, (5 species,) *Paludina*, *Trypanosoma*, fresh-water Drumfish and Deer, and with its bone awls, arrowheads, chips, hammerstones and pottery, repeating the record of the Lookout Cave. Again all trace of more ancient human presence betokened by underplaced deposits was wanting. Earlier peoples, if they existed, had avoided the Nickajack Cavern, and its only pre-Columbian inhabitant had been the Neolithic Indian, who, strewing the alluvial meadows at its mouth with arrowheads and hornstone chips, had left potsherds, pebble hammers and a perforated ceremonial stone, along with the remains of the cave midden Mollusca and the Deer, Tortoise and Rabbit, at the river-side shell heaps a mile away.

Throughout the above investigation we have owed a grateful acknowledgment to the suggestion and continued kind encouragement and assistance of Professor Cope.

January 6th, 1894. H. C. MERCER.

## BOOK REVIEW.

"Ilex Cassine, The Aboriginal North American Tea" by Dr. E. M. Hale, Government Press, Washington.

A publication something after the order of Harshberger's *Indian Maize*, yet not so broad in character. It is in pamphlet form, and one of its chief features is a splendid map showing the distribution of the plant. The author might have cited more references, and enlarged the publication. But, waiving that, it is an excellent and timely work, and we would recommend it to our readers. Copies may be obtained free through the Secretary of Agriculture, Washington.

The following publications received :

"On the Evolution of the Art of Working in Stone," by J. D. McGuire.

"On Certain Personages who Appear in a Tusayan Ceremony," by J. Walter Fewkes.

"Latrines of the East," by Edw. S. Morse.

"Manual Concepts: a Study of the Influence of Hand-Usage on Culture Growth," by Frank Hamilton Cushing.

"The Indian and the Pioneer, an Historical Study," by Rose N. Yawger, Syracuse. C. W. Bardeen, publisher.

"The Cliff Dwellers of the Mesa Verde, Southwestern Colorado, by Baron G. Nordenskiöld, Stockholm, Sweden. Translated by D. Lloyd Morgan. pp. 186. 94 figures, 82 full page plates. P. A. Norstedt & Soner, 163 Washington street, Chicago. \$17.00.

The authoritative work on the Cliff Dwellers and Pueblo tribes has appeared. It was written by one of the foremost European Anthropologists, who spent several seasons in the San Juan and Mesa Verde country. He was persecuted not a little by the ignorant public of the region explored; local collectors who demolished ruins in order to obtain specimens for sale, placed obstacles in his way. But with a commendable, forgiving spirit he does not refer to his troubles.

Baron Nordenskiöld spent thousands of dollars upon this publication. The plate of Cliff Palace alone cost several hundred dollars. We trust that students interested in the Cliff Dwellers will carefully read the volume and accept it as a trustworthy and complete treatment of Mesa Verde tribes.

Through various articles which have appeared, from time to time, the readers of the *ARCHÆOLOGIST* are doubtless familiar with the topography of the Cliff Dwellers' country. We will therefore begin directly with the Baron's account of his explorations. The table-land, known as the Mesa Verde, is divided by canons into small plateaux named after various travelers and explorers. The value of the Baron's book—and it cannot be over estimated—lies in these facts:—he is an Archæologist, and describes fully every ruin which he saw; his observations have no uncertain sound for his statements are positive; his illustrations

are the most beautiful that have ever appeared in a work upon American Archæology; finally, he conducts his studies unhampered by sentiment, free from profitless speculation, and independent of any controlling or intermeddling authority.

In one of the ruins (step house) he found several graves. "Quite close to the ruins, between them and the cliff, at the foot of a dilapidated wall, we found the body of a child. It was half mummified. One hand and the feet were in such a good state of preservation that even the nails were partly left. The head showed signs of strong, artificial depression; this was the case with all the skulls we dug up in the cliff dwellings. The corpse had been shrouded in a crouching position, with the legs drawn up to the breast, in a kind of cloth made of cords wrapped in feathers, the manufacture of which fabric I shall describe more fully below.

"Near the child-mummy, and also quite close to the wall of rock, we found a second grave; this contained an adult. \* \* \* The body had been wrapped in a kind of mat made of osiers. This mat was composed of long, narrow withes, which had been split into and pierced, at intervals of about 10 cm. with fine holes through which long cords of yucca had been passed to tie them together. \* \* \* "

Near the interments mentioned was the body of an adult completely mummified. This seemed to have been the grave of a person of importance, to judge by the care with which the body had been buried. The head had been covered with a skin cap, the feet with moccasins or shoes of the same material. The position of the body was the same as in all the other graves. The corpse was wrapped in a kind of net or cords, spirally wound with strips of hide, on which the hair was still partly preserved. These cords were further held together by strips of yucca leaf, under which thick bunches of cedar bast had been inserted. The entire absence of moisture had presumably been enough without further prep-

aration to transform the corpse to a mummy. All the soft parts were completely dried; the hair, which was black and rather coarse, still hung to the head. Under the mummy lay a mat of withes, similar to that described in the account of the preceding grave. The head rested on a short, round block of wood. A mat of the same kind as the one under the corpse had finally been spread over it. Thus enveloped, it had been buried in the ground, a couple of feet below the surface, close to the ruins. \* \* In front of the head stood a basket, half full of maize meal and covered with a handsome bowl turned up side down. Beside the basket lay a small ladle or spoon and between the two a maize cob. Both the basket and the meal were well preserved."

The Baron discovered graves of a type which seems more in keeping with the culture of the Peruvians than the Cliff Dwellers. They were neatly covered with poles, the grave being hollow. Matting covered the wooden supports. He found graves in the ruins themselves, in the ash heaps at the back of the houses, and upon the mesa. Those found in the ruins were usually in a small room, the door of which had been walled up. Regarding the estufas and their position in large cliff houses, he says: "They are generally situated in front of the other rooms, with their foundations sunk deeper in the ground, and have never had an upper story. Even their site suggests that they were used for some special purpose, probably as assembly rooms at religious festivities held by those members of the tribe who lived in the adjacent rooms."

He says that the roofs of all estufas have fallen in; that the entrance was through the roof; that the arch was unknown to the cliff dwellers.

The plates illustrating the queen of canon ruins, Cliff Palace, are the finest in the work. Regarding it, and we quote but a small portion of his remarks, he says:

"After a long and tiring ride through the boundless, monotonous pinon forest, he suddenly halts on the brink of the precipice, and in the opposite cliff beholds the ruins of the Cliff Palace, framed in a massive vault of rock above and in a bed of sun-lit cedar and pinon trees below \* \* \* With its round towers and high walls rising out of the heaps of stones deep in the mysterious twilight of the cavern, and defying in their sheltered site the ravages of time, it resembles at a distance an enchanted castle." \* \* \* He mentions the difficulty of reaching the ruin from the canon, that its bottom is full of great boulders and rocks. He says the rooms were well lighted and ventilated.

"A comparison \* \* shows at once that the inhabitants of the Cliff Palace were further advanced in architecture than their more western kinsfolk on the Mesa Verde. The stones are carefully dressed and often laid in regular courses; the walls are perpendicular, sometimes leaning slightly inwards at the same angle all around the room—this being part of the design. All the corners form almost perfect right angles, when the surroundings have permitted the builders to observe this rule."

It is his opinion that the structure was built at different times as he finds evidence of two kinds of masonry. "One very remarkable circumstance in the Cliff Palace is that all the pieces of timber, all the large rafters have disappeared. The holes where they passed into the walls may still be seen, but throughout the great block of ruins two or three large beams are all that remain. This is the reason why none of the rooms is completely closed. \* \* \* There are no traces of the ravages of fire. Perhaps the inhabitants were forced, during the course of a siege, to use the timber as fuel, but in that case it is difficult to understand how a proportionate supply of provisions and water was obtained. This is one of the numerous circumstances which are probably connected with the extinction or migration of the former inhabitants."



He passes from one ruin to another giving detailed descriptions of each. His chapter upon the Spanish narratives of 1528 to 1600 is a document of historical value and should be remembered by those who persist in believing that *all* ruins of the southwestern part of the United States are pre-Columbian. We quote at length from his last chapter ;

SUMMARY OF OUR PRESENT KNOWLEDGE OF  
THE PUEBLO TRIBES.

"We will first examine \* \* \* the origin of the Pueblo tribes. The primitive Pueblo culture, as we find it in its typical development among the Cliff Dwellers of the Mesa Verde, may be traced almost everywhere within a sharply defined region. \* \* In the south of this region we can trace foreign influences [he refers to central New Mexico], the antiquities seem here to be of a more diversified character. To the north, on the other hand, within the basin of the Rio Colorado, the prehistoric remains belong to a single characteristic type, in several respects quite peculiar to the tract. There is no conformity of style, there are no steps of transition, that might entitle us to compare the culture of the Pueblo tribes, as it appears in their architecture and their pottery, with that of any other people. In these respects this culture bears the stamp of perfect originality. But if we study the other domestic appliances of the Pueblo tribes, their weapons and implements, we find scarcely any essential differences from the nomadic Indians in general. It is evident that the Cliff Dwellers do not compose a race distinct from these Indians, but are related to them. Several other circumstances favor this opinion. The crania found in the graves of the cliff dwellers differ, according to Prof. Retzius, in no essential respect from those of the neighbouring nomadic tribes. The round shape of the estufa is most easily explained on the hypothesis that it is a reminiscence of the Cliff Dwellers' nomadic period. \* \* \* While we must undoubtedly regard the Pueblo tribes as the descendants of nomadic Indians, the culture of the said tribes, as I

have just mentioned, shows some very essential distinctions. In certain respects they unquestionably stood higher than their ancestors, the nomadic tribes." He follows up this line of argument with several pages of logical and clear reasoning, showing how a nomadic people could become an agricultural people as were the Pueblo tribes

In conclusion he says: "There is no resemblance between the cliff dwellings or the Pueblo ruins and the magnificent architectural remains so numerous in certain parts of Mexico. Nor does the pottery from the cliff dwellings bear any likeness to the ancient Mexican ware.

"I shall conclude with a brief summary of the results at which I have arrived respecting the origin and development of the Pueblo tribes. They were nomadic Indians whose culture had been considerably modified and in certain respects elevated by altered conditions of life. The evolution of this culture had nothing in common with that of the ancient Mexican civilization ; but during its decadence it was perhaps influenced in some respects by the latter."

**Lectures on Archæology and Ethnology  
by Dr. D. G. Brinton, Professor  
of Ethnology and Archæology,  
University of Pennsylvania.**

The extract given below is from the Doctor's programme, and shows the breadth of his discourse :

**"LECTURE V. AMERICA IN THE SEMI-HISTORIC AND PREHISTORIC PERIODS.**

"Geographical Relations of the Two Americas.

"I. *Semi-Historic America*. The Civilization of Mexico and Central America, and its Antiquity. That of Peru. Other Partly Historic Civilizations ; The Calchaquis ; The Chibchas ; The Pueblos and Cliff Dwellers ; The Mound Builders ; Legends of the Iroquois and Algonquins. The Question of the Origin of Native American Culture. Was it Derived from the Old World ? Course of Semi-Historic Migrations in America.

"II. *Prehistoric America*. The Glacial Period in North and South America. Alleged Remains of Glacial or Quaternary Man in America. Character of the Supposed Oldest Art Remains and Human Bones. Results of Cave Exploration. How America was Probably First Peopled."

No other American Anthropologist has presented such a series of lectures as those given by the Doctor at the Academy of Natural Sciences, Philadelphia. They have attracted general public attention. Professor Starr's lectures at the University of Chicago cover a similar field and are interesting and important. Professor Putnam confines his Harvard discourses to North and South American Archæology and Ethnology with possibly more detail than the other gentlemen give, as his work has been in the Americas alone. He does not attempt to treat of savage races in general.

We are indebted to Dr. Wm. Bringhurst for a statement regarding Dr. Brinton's course. He says:

"Dr. Daniel G. Brinton, Professor of Ethnology and Archæology, at the Academy of the Natural Sciences, is now engaged in delivering a course of six lectures on Archæology, and gave the first one yesterday, January 29th; the theme being, 'The Aims and Methods of Archæology.' I need not say how interesting he can make them. He dwelt on the prehistoric, the semi-historic, and the historic periods, the aim of Archæology being to complete the record when History fails to do so. History is dependent on dated documentary evidence. The sources of information we have resort to the semi-historic period are traditions, languages, folklore, religious myths and rites, monuments and relics, and physical traits. The sources we repair to in the prehistoric period are monuments and relics, physical traits, comparison of earliest culture with that of lowest existing tribes, and geological relations of ancient remains. He dilated to some extent on the knowledge obtainable by an examination of osseous remains, as to how a skillful anat-

mist by their means would be able to give a pretty concise history of the people to whom they belonged; what was their altitude, their physical strength, their brain capacity, the relative numbers of the two sexes, whether they were peaceable or warlike, indulged in cannibalism, and judging from healed fractures of bones, say of the thigh, whether they were kindly or not as misfortunes of that kind would need tender nursing and living attention from surrounding people, and so on. One evidence as to the age of bones is found in the presence of a greater or smaller proportion of fluorim in them, the more they are found to contain the oldest they will be. The annals of human culture may be divided generally into two stages; that one when the available implements with cutting edges were furnished by lithic or stony materials and that one, when metals were so applied."

He refers to the Doctor's divisions and subdivisions of the stone and metal ages.

The management of the ARCHÆOLOGIST feels highly complimented at the press notices which appeared in Boston, New York and Cincinnati papers concerning the February number. We are pleased that our journal is so well received.

Miss Alice C. Fletcher, in the January Century, gives an excellent illustrated article upon Indian music. She does not treat of the music of the Sioux Messiah Craze of three years ago. The music accompanying the Ghost dance is very interesting. The editor was at Pine Ridge during the troubles and will shortly give the readers of this magazine the history of the Craze.

Mr. Mercer's article upon field work in the interests of the University of Pennsylvania is even more interesting than his last communication. His work is of great importance and is carried on with care and intelligence.

The New Jersey Legislature is considering a bill appropriating \$5,000 for a State Archæological Museum. This is a very commendable step.

## COLLECTORS' DEPARTMENT.

## AN ARCHÆOLOGICAL FIND

**Among the Ruins in Tlaxlaco, State of Oajaca, Mexico.**

CITY OF MEXICO, Feb. 18.—A discovery of great scientific interest has been made in excavations being carried on in the district of Tlaxlaco, State of Oajaca. A number of small images, formed in metal, were uncovered by the workmen in one of the oldest ruins a few days ago. The images represent people of Aztec appearance and dress, as well as priests in their robes of sacrifice. The images bear hieroglyphics of unknown characters, and are elaborately wrought, with fine art lines shown in every curve.

The images found thus far are of gold, either wholly or in part, and are coated with some unknown enamel. They will probably be shipped to the National Museum in the City of Mexico, where they will be placed at the disposal of the scientific world for further study and discussion. The find is the most important of the year in the domain of antiquities, and preparations are now being made to conduct a complete exploration of the Tlaxlaco ruins for further evidence of the ancient civilization which is known to have flourished in Southern Mexico.

**INFORMATION FOR COLLECTORS.**

(Continued.)

Flint instruments are distributed over the entire globe. In each class of implements there is much similarity as to form, thickness, and style of fabrication. This is not surprising when we take into consideration that all volcanic, flinty or glass-like substances chipped by primitive peoples, would naturally exhibit the same general type. The unusual specimens found in flint do

not form a large class. For instance, effigies or axes of this material, are rather local in their occurrence. We do not find in this country any flint axes resembling those of Europe, while effigies of flint, such as are occasionally found in the Central States, seem to be unknown in Europe. The flint implements of the world have been frequently grouped, but the classification employed by European archæologists cannot be applied to American specimens. The large axes of England and France — some of which are perforated in order that the handle may be inserted — have no corresponding type with us. The small flint celts found mainly in the Southern and Central States, but feebly represent the large flint celts of Europe, although they are better adapted than the ordinary stone axes for cutting or chopping. It is surprising that aborigines, possessing as they did, in this country, the enormous Flint Ridge quarries of Ohio, the nodular flint found in Kentucky, Tennessee and Indiana, the great deposits in Arkansas, Indian Territory and the Ozarks, should not have made in any considerable numbers, larger tools of so well adapted materials.

The smaller implements, such as arrow-heads, spear-heads, knives, scrapers, drills, etc., may be divided into six or seven great classes, with sundry sub-divisions. Dr. Rau of the Smithsonian Institution some years ago formed a table by means of which he essayed to classify all the flint implements of the United States. This table included thirty or forty names. Dr. Thomas Wilson, his successor, originated a much shorter and better method of classification in 1888. He adopts five divisions, and under these are six or seven sub-divisions. Thirteen or fourteen names embrace, in his scheme, all of the flint specimens of the United States. Mr. Gerard Fowke suggests

the following, which is simple and yet comprehensive :

Stemmed.	{	Barbed.	{	Notch'd from side
		Unbarbed.		“ corner
		Tanged.		“ base,
		Untanged.		Tapering neck, Straight neck, Expanding neck.
Unstem'd	{	Triangular	{	Straight base,
				Concave base.
		Leaf-shp'd		Convex sides,
				Straight sides,
				Convex base.

Prevailing  
types east of  
the Hudson  
River.

Types of  
Pennsylvania,  
New Jersey,  
Delaware,  
Maryland,  
District of Co-  
lumbia, Vir-  
ginia, South  
Carolina and  
New York.

Types of New  
York and  
Pennsylvania.

Types of  
North and  
South Caro-  
lina, Florida,  
Georgia, Ala-  
bama and  
Mississippi.

Quartz arrow-heads, rough or well made, usually unbarbed and untanged. A few slate, jasper, argillite and quartzite knives, spears and arrows. Rude points predominate. True flint seldom, if ever, found. In Maine a few large spear-heads.

Argillite and quartz numerous. Best specimens of the former material. Some jasper and chert. A few Flint Ridge implements on the western slope of the Blue Ridge. No long barbs, and few well made points. Less than two per cent. can be considered of fine workmanship. In all localities scrapers and drills very rare,

New York (Western), native black flint, brown chert and jasper. Some quartz, some Flint Ridge stone. Better workmanship than in New England, but strongly following its forms. Knives and scrapers limited. Some side notched points. Few drills, some scrapers. Pennsylvania, quartz and argillite common, some slate points. In the western part, Flint Ridge material, native flint and chert.

In Florida a white hard limestone used; quartz ranks second; little, if any jasper or argillite. Jasper points (good) common in Mississippi. Quartz and argillite largely in the Carolinas, Georgia and Alabama. In the two latter many specimens of chert and impure flint. Thick and rude. Some tanged but nearly all unbarbed or triangular. Large chert spears common. A small number of drills and scrapers.

This applies to knives, spears, or arrows, regardless of size of outline, to drills or perforators, and to scrapers. Thick and rough specimens (I do not refer to paleoliths) are not considered finished forms, but represent a stage in manufacture, and therefore do not enter into classification. Specimens having beveled edges (called "rotary") and those having serrated edges, are minor modifications of any of the above forms. Most of the larger leaf-shaped and triangular implements may be called knives, as such are found in the cliff-houses of the West, set in short wooden or horn handles, evidently for use as cutting and scraping tools. The only line drawn on account of size is that between arrow and spear-heads. No certain rule is to be laid down whereby the collectors may distinguish one from the other; few modern Indian arrow-heads of stone are more than two inches long; and these few are thin and slender.

Before I proceed with a description of subdivisions, it is best to submit a table which all collectors should memorize. It gives, as correctly as possible, considering its condensed form, the distribution of arrow-heads, knives, spear-heads, etc., according to their material and shapes. Familiarity with it will guard the collector against dealers who label implements from a distance as belonging to the locality from which they are sold.



Types of Tennessee, Western Kentucky, and Indiana.

The gray, blue (dark) nodular hornstone very abundant. Large "swords" in Western Tennessee and Kentucky. Scrapers, knives and drills very common. Quartz in south and east Tennessee is common. Jasper rare, chert common. Some Flint Ridge stone in Indiana. Many types present, workmanship very superior to that of southern or eastern localities.

Ohio and Eastern Kentucky and West Virginia.

Flint Ridge stone predominates. Beautiful forms, fine chipping is characteristic. A few chert objects were made. Some quartz in West Virginia mountains. Along Ohio River majority of specimens of nodular hornstone, with wide range of colors, from east Kentucky. Little foreign material present. All types are peculiar. Tennessee, Kentucky, Missouri, Illinois, parts of Michigan, and the Pacific Coast can alone compete with this section. Deep notched, rotary, serrated points, drills and scrapers numerous. No eastern or southern types.

Types of Arkansas, Missouri and Illinois.

Long slender points of white flint in Missouri and Illinois. Jasper and yellow flint in Arkansas. Some Flint Ridge material. Great spades and hoes numerous, mostly from deposits in southern Illinois. Some of the same forms as in the Ohio Valley, but nearly all of white or light yellow flint.

Types of the Great Plains, including Texas.

Towards the Rockies, points of semi-precious stone (agate, chalcedony, etc.), and volcanic material are numerous. Kansas, Nebraska, the Dakotas and Minnesota have specimens

Types of Wisconsin and Michigan.

made of local materials, mostly grayish chert and yellow impure flint or jasper. Little systematic work has been done on the plains, and classification is difficult and meagre.

A peculiar translucent, reddish brown stone, of beautiful luster, which mineralogists have hitherto failed to classify and whose origin is unknown, appears in Wisconsin and Michigan in various forms, from small arrows to ceremonial implements of large size. Cache implements numerous in Michigan. Gray and white flint (a poor grade, similar to chert) abundant. Some drills and scrapers. Many small arrow-heads of white flint. A few of quartz.

Types of the Pacific Coast and the Rockies.

This great region may be set down as representing a marked relationship. Obsidian and semi-precious stones constitute nearly all the implements. The large knives and spears are all of obsidian. They are more skillfully made than any other chipped relics of America. Collectors are all familiar with the "Oregon"

and "Arizona" points. These delicate arrow-heads are found in the Rockies, in the Cliff Dweller country, and upon the site of ruined Pueblos. The chipped implements of semi-precious stones, whether small or great, cover the greater portion of western America, and evince the highest skill in their manufacture. Neither drills nor scrapers are numerous in the Upper Mississippi Valley. Quartz implements are confined to a limited area; the same can be said of flint spears and arrows of nodular hornstone. Jasper is rather wide spread; argillite closely confined to a region 175 by 300 miles in extent.

The cache implements are of two types, the leaf-shaped or finished knives and lance-heads, and the circular or oval disc. The latter are believed by some as to be cores or unfinished implements. Others regard them as hoes, digging tools, or scrapers. The smallest find of these implements was made at Flint Ridge, Ohio, by Mr. Fowke—four large specimens of the leaf pattern. The largest cache ever discovered was at the Hopewell group of mounds at Anderson Station, Ross county, Ohio, excavated in October, 1891, by Department M. (W. C. E.) Survey which secured 7,232 oval and round discs made of nodular hornstone, several hundred having been taken out previously by others. Mr. H. I. Smith has found several deposits in Michigan. It is generally conceded that the oval and round discs are unfinished implements; in other words, the material was worked down to a convenient form for transportation or exchange. Large spear-heads and knives, or many small objects could be readily manufactured from one of the discs. Cache deposits probably represent the stock in trade of some primitive merchant, or implement manufacturer.

Scrapers constitute a large and important class of flint implements. Among them are thick, curved flakes, one end or edge of which has been chipped to a chisel form. Curved scrapers were exceedingly convenient because the under surface was always smooth, and the implement would neatly fit the hand, lying along the side of the index finger, with the end against the base of the thumb, and the scraper edge slightly protruding beyond the joint of the index finger. Scrapers were often made from broken arrow heads. Nearly all scrapers having notches were originally spear or arrow heads. The primitive artisan showed his good sense and economy in utilizing broken specimens in this manner.

Spear-heads range from three or four inches in length to ten or twelve. The average can safely be put at four inches. Those above six inches in length are ex-

tremely rare. They are usually barbed or tanged, or both. In the latter case the notches usually enter from the corners. Spear-heads differ from arrow-heads only in size, and the detailed description given below will suffice for both.

The finest spear-heads are made of obsidian, and are numerous in Mexico and upon the Pacific Coast. Those of Flint Ridge stone are very beautiful and are delicately chipped. Drills above three inches long are extremely rare, small ones are quite common. The base may be little wider than the blade or broadly expanding. When barbed they often resemble a bird with out-spread wings; so much so, that some collectors consider them "totems" of a clan called by the name of some bird.

Arrow-heads exist by millions; they exhibit the fancy of the maker more than any form of relics, for the various unique and fantastic patterns resist all attempts at classification. Dr. Rau, of the Smithsonian, coined the very appropriate expression "individual crankism"—merely a whim of the artisan, and not made with any special purpose or design. That is, the aborigine made such patterns as he fancied, out of such stone as he could get, but would scarcely discriminate against that most easily made and best answering his needs. The bird points, war points, spears or other things may have been used for special purposes, but—it must be remembered that I am referring to the general arrow-heads now—you will find dividing them is like hair-splitting; a man does not have a different sort of pocket-knife for every purpose to which such an instrument may be applied.

Flint was essential to the savage; his very existence depended upon it. While it was seldom used for making fire (the bow drill, hand drill, and sticks serving this purpose) he depended upon it for all the usages named above—in fact it served him as steel serves us.

The manufacture of flint implements from the raw material will be described later.

*(To be continued.)*

AUBURN, N. Y., Feb. 6th, 1894.

EDITOR OF *ARCHÆOLOGIST*:—Much discussion has been provoked of late in the Central New York papers over the finding at Branchport, Yates Co., N. Y., on the banks of Keuka lake, of the alleged skeleton of the mother of Red Jacket, the famous Indian orator of the Six Nations.

This discussion has brought to light many interesting facts regarding the finding of huge Indian skeletons in the Seneca territory. The skeleton above mentioned, was extraordinary in size, and that coupled with the fact that the mother of Red Jacket was a woman of huge proportions, is the only theory on which these allegations are based. There was nothing to indicate that the remains were those of the mother of Red Jacket; there being no distinctive signs that would point to such a conclusion. In fact, it would be just as reasonable to affirm, that some of the numerous remains exhumed in other localities in Central New York were those of this woman, as well as to settle upon those found upon lake Keuka as being the particular one. The fact that the skeleton was gigantic in size is the only indication of identity, and is a very meager point on which to base so important a conclusion.

In the language of Irving W. Coates, of Shortsville, N. Y., a well known Antiquarian: "So far as my study and observation in regard to local Indian history extends, the finding of such an Indian skeleton, either male or female, as the one exhumed at Branchport, is no strange or unusual occurrence. On lot 98 in the town of Manchester, Ontario county, N. Y., several years ago, skeletons were dug up nearly seven feet in height, and on the old turnpike road leading from Geneva to Canandaigua, skeletons of very large dimensions have been exhumed. But two or three years since, the skeleton of a gigantic Seneca warrior was exhumed in the old burial ground of Onnaghee in the town of Hopewell, Ontario

county, that was, according to the measurements taken by observers on the spot, nearly seven feet in height and proportioned accordingly, and the weapons which were discovered with the remains proved them to have been those of a person of great physical strength. These weapons, which are immense implements of primitive warfare, are at present in the possession of Mr. Case, of Hopewell, N. Y., a local antiquarian."

Near Geneva, N. Y., a number of years ago, while some workmen were grading and excavating, large quantities of Indian bones and skulls were taken out, many of which were in an excellent state of preservation. Most of these appeared to have belonged to adults of a large-sized tribe, and in one or two instances, were of extraordinary size.

At Dresden, N. Y., in Yates county, twenty years ago, workmen employed in a brickyard unearthed hundreds of skeletons, together with their implements of warfare, some of the skeletons being unusually large, and one noticeably so. A local physician, on viewing it, pronounced it to be that of a man.

On Bluff Point, on Lake Keuka, located in a piece of woodland, on a spot cleared of timber, but overgrown with underbrush, was a raised mound, about nine feet long and four feet in height, and about the same width, which upon being opened, was found to contain the bones of some noted chieftain, with a full equipment of weapons.

From what information we can gather, the Senecas in particular, in point of physical form, strength and beauty were the flower of the nations that went to make up the great Iroquois confederacy. This being demonstrated by the fact that they were made the custodians of the western door of the famous "Long House", at once the position of greatest danger and highest honor. Their warriors were proud and haughty in their bearing, and brave even to rashness, while their women

were many of them unusually strong and remarkably large in stature, their height being a noticeable characteristic.

\* In the vicinity of this city, but a short time ago, workmen, while digging in a gravel bank, exhumed a huge Indian skeleton, and firmly embedded in a section of the vertebræ was found a flint arrow-head, which would indicate that this gigantic warrior, being feared by his enemies owing to his enormous size and great strength, they had stealthily approached him from behind and shot him in the back.

Many more interesting and curious facts and finds in this locality could be cited if time and space permitted, as there is hardly a neighborhood in the whole county that has not some peculiarity in this direction.

GEO. H. MACOMBER.

The following extracts from letters written to Mr. Macomber are self explanatory:

"About the skeleton, it was buried with the head to the south, and although not in a sitting posture, the head was considerably higher than the feet. \* \* \* the whole skeleton was so decayed that I was unable to preserve any of it. The relics were beads, a pipe, a kettle (of French make, I think) a gun, an ax, a comb made of the shoulder blade of some animal, two knives and a few flints. The beads were made of shell and red slate. There were quite a number of glass ones, in all about two hundred. There was one baldric bead. The pipe was made of clay, without any particular design, and was not glazed. It was about eight inches long. The kettle was made of brass. It contained fish bones and acorns, also bones of an animal. The comb had carvings on it. They represented a snake, a bird and some other things I could not make out. Among the stone implements was a celt, three or four gun flints, two arrow-

heads and one ornamental stone. There was also quite a quantity of red war paint.

Yours truly,

"H. C. CASE.

"March 17, 1894."

"In regard to the finding of the large Indian skeleton in the old burial place of the former Seneca's town or 'Castle On-naghee,' in the southwestern part of the town of Hopewell, this county, it was that of a chief or warrior of the historic period, and his weapons were of unmistakable French origin and not prehistoric stone weapons, as you have been lead to believe. The skeleton was of a large size. \* \* \* The weapons were unusually large even for their class, the tomahawk weighing, I should judge, some three pounds, while the gun barrel and trimmings were more than ordinary size and length. \* \* \*

"Yours truly,

"IRVING W. COATES.

"February 21, 1894."

Dr. Brinton's article in the Forum some months ago seems to have attracted the attention of newspapers all over the United States. His titled was, "The Beginning of Man and the age of the Race." We trust that Dr. Brinton will give the public more of these articles. Our people do not pay the attention that they should to archæologic matters, and articles such as Dr. Brinton has written will do the science a great service.

The Anthropologist (Washington, Jan., '94) prints a lengthy article upon "The Remains of Don Francisco Pizarro." This article has also been copied extensively by the papers and has aroused no little interest in the work of Prof. McGee, Mr. Holmes, and others connected with the publication,

Dr. Brinhurst of Philadelphia describes in a letter to the ARCHÆOLOGIST several obsidian knives and celts purchased by him at an auction in New York. The largest celt weighs 2 $\frac{1}{2}$  pounds and is 11 $\frac{1}{2}$  inches in length. These types are quite common upon the Pacific coast.

\* Among Collectors there is a prevailing tendency to exaggerate the height of skeletons.—EDITOR.



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NO. 5

## PRIMITIVE COPPER WORKING: AN EXPERIMENTAL STUDY.

BY FRANK HAMILTON CUSHING.

From the *American Anthropologist*, Washington, January, 1894.

(Concluded)

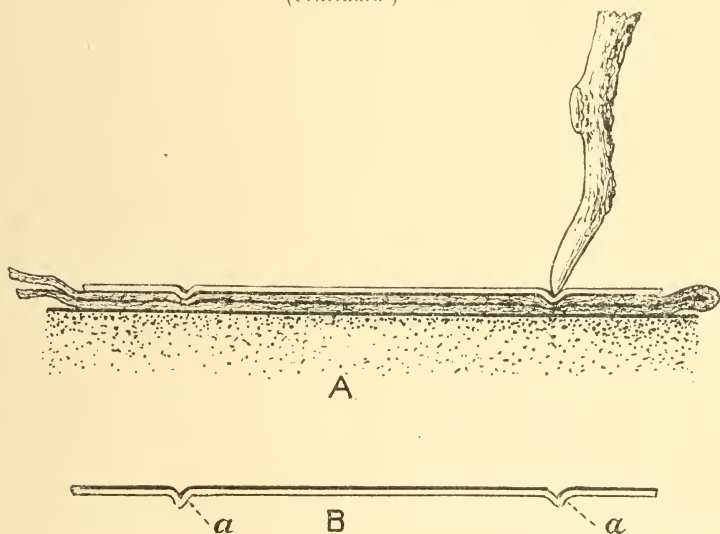


FIG. 6.—Sections showing method of line embossing (A) and depth of groove necessary for severing by grinding (B).

SINGULARLY enough, the edges of patterns or forms cut out of a thin metal sheet as described in preceding paragraphs, by embossing from one side and grinding off on the other, require but little finishing. Their marginal lines are very clean and not much thinned. This may be explained by the accompanying sections of an embossed plate.

The groove being made sufficiently deep (Fig. 6, A), the upper surface of the metal is depressed to or beyond the opposite surface (Fig. 6, B, *aa*), so that the groove itself is bounded by walls, the axis of which are at an obtuse angle to the plane of the plate. Thus, when the plate is reversed and the apex of the groove is ground off (Fig. 7, C), these walls

are in turn cut off nearly at right angles to their vertical plane, and are therefore blunt and slightly beveled, not thinned to a knife-edge, as might be expected. On being hammered down (Fig. 7, D, *a a*) the edges appear as they would if cut almost vertically by a powerful graver or shear.

Before my visit to the Columbian Exposition it had been impossible for me to examine originals for traces of processes kindred to those I had employed. An inspection of Moorehead's specimens exhibited there, and, subsequently, of those comprising the collection now in the Bureau of American Ethnology, convinced me that they had been worked by methods probably similar to, if not identical with mine. First, the plates of which these figures were made had been smoothed

(too small for the introduction of pointed grinding stones), had not been dressed from the inside, as they might have been had the artificers of the specimens possessed slender files, but had been left sharp and raised, and showed distinct trace of the horizontal grinding by which, after they had been partially punched or raised, they had been cut through; fourth, after the outlines and open spaces had been cut in the more elaborate of these specimens, the latter had been again turned over and embossed, mainly by pressure, from the side opposite the one from which they had been impressed for the cutting.

Additional points of technologic significance and interest, developed by my experiments and by comparison of their results with features of workmanship on the an-

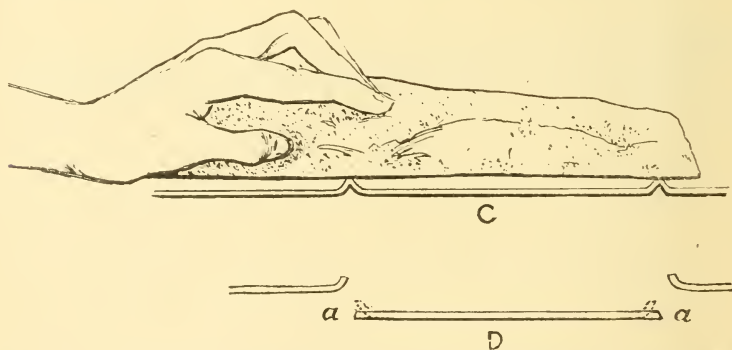


FIG. 7.—Sections showing method of severing figures from copper plates by grinding (C), and of flattening edges of figures after severing (D).

by scouring; second, the cut edges of figures or open-work patterns were slightly beveled, except at points where they had been more or less dressed down by crosswise grinding with gritty stone; third, the edges of small open spaces, such as holes (other than drilled ones) less than an eighth of an inch in diameter

cient specimens under discussion, might be presented. Reserving these, however, for a future paper on primitive metallurgic art in America, I do not hesitate to say, in summing up this portion of the present study: first, that I have neither seen nor heard of a single object of copper from the mounds which I cannot reproduce from

native or nodular copper with only primitive appliances of the kinds described, by successive processes of stone-hammering, beating and rolling, scouring, embossing and grinding—such processes as, in more or less modified ways, are actually employed today by comparatively rude Indians in the fashioning and embossing of parfleche, horn, and other like

substances; second, that sufficient results of these experimental studies have been above brought forward, I trust, to establish as an easy possibility, if not probability, the aboriginal and prehistoric character of the workmanship on the sheet-copper articles from the Ohio and more southern mounds.\*

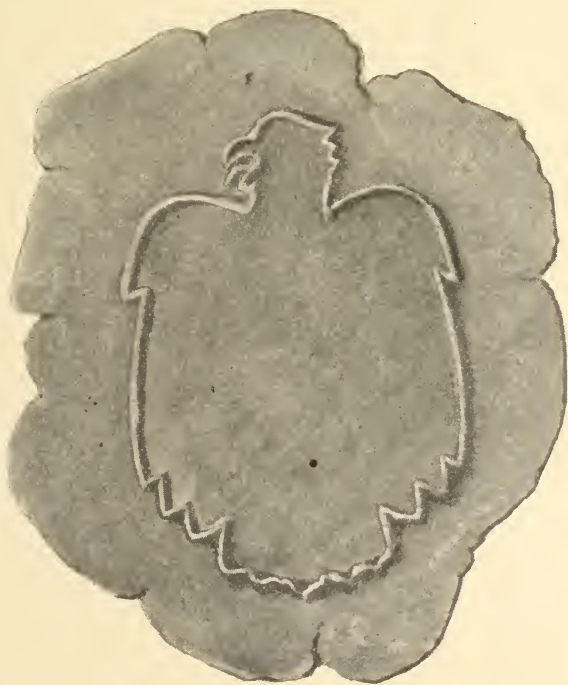


FIG. 8.—Hammered plate of copper showing line-embossed figure of eagle prepared for cutting out by grinding.

\*In reference to this, Professor Putnam writes me that he had convincing evidence in the same direction, several years ago. I am glad of this opportunity to at once acknowledge the courtesy of his letter and quote his remarkably confirmatory and archæologically significant statements. Of the "Turner Group" of mounds explored by him and others, in 1881, he says:

"There we found on one 'altar' nuggets of copper just as they were picked up; others which had been slightly hammered; others which had been hammered into thin sheets. Associated with these were thin sheets of copper and many ornaments cut out of such sheets. These sheets showed the process of hammering and a slight variation in thickness; and they also showed that the holes and lines had been cut in such a manner as you describe: that is, by pressure, and then rubbing off. The striæ of the rubbing is even to be seen. So, from the specimens themselves, I had worked out the method which you actually describe. \* \* \* It is fully time that we acknowledge that our old peoples, particularly the people who made the great earth-works in the Ohio Valley, were pretty far advanced in many of the arts, and certainly had reached a high plane of achievement in the working of native copper, native silver, native (meteoric) iron, and occasionally gold, all by hammering, pressure, rubbing and cutting."

This evidence may be re-enforced, I think, by a few additional brief considerations relative to especially the symbolic art displayed in these specimens, and to its relation to mound art as shown in other materials.

Professor Holmes, than whom no higher authority could be quoted on this subject, has stated that "if in the end it should turn out that these remarkable [copper] objects are the unaided work of the mound-builders, we shall be compelled to recognize their standing in the manipulation of metal, and in the art of design generally, as unsurpassed by any other native American people."

Probably no one influence so greatly affected this high development of the mound-builders in copper-working as the occurrence in the Lake Superior region of almost limitless, easily accessible supplies of the pure mass metal. There is abundant historic evidence\* and there is still stronger archæologic evidence of the wide

distribution of this copper among native tribes at the time of the discovery, and throughout the entire mound region, at least, in prior times. The only known deposits of native copper other than those of Lake Superior that contain occasional masses of free malleable silver are, I am told, those of the Ural mountains, in Asiatic Russia, and these were discovered and worked only in comparatively recent times.† If this be true, articles of beaten copper containing patches of this pure silver, like those found by a friend of mine a few years since in Florida, afford indisputable evidence of the distance to which copper from the Lake Superior quarry mines was transported; and as in nearly all other sections of the mound area these bits of native silver have been found thus mingled with or purposely separated from copper fragments and objects; the conclusion is equally warranted as to the same source of derivation. But most signifi-

\* Much of this evidence is gathered together and admirably presented in a scholarly little paper on "Prehistoric Copper Implements," by the Rev. Edmund F. Shafter, A. M., privately printed at Boston, in 1879. I would have quoted largely from this paper, had I been acquainted, previously to the above writing, with its contents. Even now, I cannot forbear extracting from it one most significant passage. Referring to the account of Champlain's voyage down the St. Lawrence in 1610 to meet a party of Algonquins, Hurons and Montagnais, the author quotes (p. 134) as follows:

"Shortly after conferring with them about many matters concerning their wars, the Algonquin savage, one of their chiefs, drew from a sack a piece of copper, a foot long, which he gave me. This was very handsome and quite pure. He gave me to understand that there were large quantities where he had taken this, which was on the bank of a river, near a great lake. He said that they gathered it in lumps, and, having melted it, spread it in sheets, smoothing it with stones."

Not only is there clear allusion in this to the Lake Superior copper source, (even more pointedly referred to in writings of earlier and other explorers, both earlier and later than Champlain,) but also, the processes I have *experimentally* worked out, are here distinctly described. For, it is quite proper to infer, that, in speaking of the *melting* of the copper lumps, Champlain mistook the meaning of the Indian when trying to describe the mere heating or annealing of them.

† Since the above was first published my attention has been called to the fact that within a few years copper containing small patches of such silver has been discovered in Lower California; but no traces of aboriginal mining operations have thus far been found there. At any rate it is not likely that worked specimens found east of the Rocky Mountains could have been derived from a source so inaccessible as well as remote.



cant in this connection is the fact that, previously to the present century, only one effort was ever made, so far as is known, by other than Indian stone-age peoples, to quarry or mine the Lake Superior copper. This was undertaken by the Jesuit fathers, who so signally failed that they abandoned the attempt almost immediately, and it is well known that it was not until near the middle of the present century that mining operations were resumed there by the English and ourselves.

From this and from the fact that traces of vast quarrying operations on the shores of Lake Superior attest to the activity there of aboriginal miners for a very long period, we may venture

Another influence, scarcely less potent, must have helped to develop their skill. Among all tribes of America who, when first known or subsequently, possessed a practical knowledge of metal-working, the beginning of true artisanship was developed; that is, a distinct class of special workers existed or speedily came into existence, as among the Northwest Coast tribes, the Zuñis and the Navajos—a more distinct class than the especially skilled arrow-makers and shell workers of more primitive conditions. This, we may believe, was likewise the case with the mound-builders, and that the result of it was, as with the modern tribes mentioned, the development of the highest pos-



FIG. 9.—Shell gorget, engraved with representation of contending Man-Eagles.

to assume that this Lake Superior copper was known to the mound-builders for such length of time, and was procurable to such extent, that being workable in the natural or raw state, it inhibited their discovery of the value of smelting and casting, and correspondingly stimulated their knowledge of and proficiency in its treatment by hammering, pressure, etc.

sible deftness in the use of means and materials available.

Among the mound-builders this art in metal must have been influenced primarily, both technically and otherwise, by their earlier arts in stone, bone, horn, and shell, and must have reacted later on these arts; hence remains of their finer products in all these diverse materials exhibit striking unity of design and similarity of

conventional treatment. This is especially true of their larger ornaments and amulets in shell as compared with their badges and decorations in sheet-copper, for both materials were precious and probably sacred, and both, if I may judge by further experi-

grinding materials, to serve for engraving shells or cutting out sheets of mica, etc., quite as well as for working copper without these accessories.

It is not surprising, then, that in copper, shell, and, to a less extent, in mica, the same figures



FIG. 10—Embossed copper plate representing Man-Eagle of War.

ments, were to some extent manipulated in similar ways. Horn or wooden tools, like those employed in embossing copper, had but to be tipped with gravers of flint or other hard substances, or used in connection with sand or other

are often found represented in almost identical lines and outlines, as illustrated by Figs. 3, 9, 10, and 11, reproduced by kind permission from the earlier reports of the Bureau of Ethnology.

One of the most striking feat-

ures in designs of like character common to both shell gorgets and copper decorations, is their frequent bilateral symmetry, as may be seen by comparing outlines of wings, etc., in Figs. 3, 9, and 10. I have explained this in the case of the copper objects, (See *ARCHÆOLOGIST* for April, 1894, p. 105), as probably resulting from the employment of thin half-patterns as guides for the points of tools used in embossing, and it seems not impossible that part patterns of a similar nature may have been used, first on one side, then on the other, as guides for the graving and grinding tools used in carving such shell figures as the one, for example, from Tennessee shown in Fig. 9.

Another feature common to all winged figures, whether represented in copper or on shell, is the peculiar decoration of the feathers with series of semi-circular indentations or cuttings along their inner edges, as shown in Figs. 9 and 11 (shell), 3 and 10 (copper).\*

It may be seen that some of these semilunar feather markings in the design of one of the shell specimens from Georgia (Fig. 11) are cut entirely through. This kind of open-work in engraved and carved shells is common, such semilunar incisions or perforations being particularly frequent, perhaps because of the facility with which they could be incised by working a graver back and forth inside of or around a semi-circular guide, or could be perfor-

ated by drilling one large and two smaller holes close together.

There can be little doubt that the mound-builders thoroughly understood this art of engraving shell long before they had acquired a practical knowledge of copper. There can be as little doubt that when they first began to work in copper the supply of this metal was very limited. Thus their ingenuity was taxed and their abilities quickened to make as much as possible of the little copper they had, by beating and otherwise drawing it out into very thin sheets or leaves. In doing this they could not have failed to observe that as soon as thinned, the copper took the impression of any hard surface or body it was being worked over, precisely as would moistened hide or softened and flattened horn. This, then, I imagine to have been their beginning in the repoussé treatment of copper. At first, we may suppose they rolled sheets of the metal around their long bone and shell beads, which in time led to the making of the long cylindrical copper beads so common in the mounds. With such sheets they also covered their double ear-beads of shell, then spool-shaped ear-buttons of horn, until finally they also made the copper ear-buttons, likewise so common in the mounds, of the metal alone. Thus, too, they coated their shell gorgets or the figure-designs on them, pressing the thin metal into the lines and spaces of these designs with tools of horn and bone. If one of these

\* This is also characteristic of many winged figures in stone, whether carved in the round or merely incised, as on an engraved tablet from Tennessee, described by W. E. Meyer in the January number of *THE ARCHÆOLOGIST*, and figured on page 11 of that issue. I may say in passing that the "Eagle-Man" shown in this illustration, evidently does not represent (as do most of those referred to further on in the text,) the god himself, but a dancer costumed to personate him.

shell figures, in which the semi-lunar marks on the wing feathers had been simply incised, were thus coated with thin, soft copper, it will be seen that these marks would show in the metal as semi-lunar grooves. If a shell figure in which the feather marks had been represented by perforations were thus coated, then the sheet-metal would sink abruptly a short way into these open spaces and show as clear-cut half-round indentations, as though punched in with a flat-faced die.

It is probable, then, that this inappropriate, though characteristic and conventional way of representing feather flutings in the wings of copper figures, so natural when worked in shell, originated in the copying of such copper sheathings when severed from shells having similarly shaped incisions or perforations. The origin of yet other characteristics of the copper figures not easily accounted for otherwise, may thus be readily enough explained.



FIG. 11. — Shell gorget engraved and carved to represent Man-Eagle of Was.

It is a fact that on all winged figures in sheet-copper thus far found, the semilunar wing marks invariably present one or the other of these forms of indentation, either grooved outlines corresponding, as it were, to incisions on shells, or else flat depressions representing, so to say, perforations in shells.

The inference is that, as to design, the copper art of the mound-builders was to a great extent derived directly from their shell art, and therefore that it was as probably indigenous. This inference is strengthened by an analysis of certain symbolic tokens, or signs of special mythic concepts, to be seen in the figures as portrayed on both copper and shell.



By examining Figs. 3, 9, 10, and 11, it may be seen that they all represent *one thing*, the Eagle God, either in his simple or animal form, but with the mark of "doom" or "war" on his face (Fig. 3); or else as the Giant "Man-Eagle of War" (Figs. 9, 10, and 11). In all of these figures of the Eagle War God, whether as Eagle Man (Fig. 3, Illinois) or as Man-Eagle (Fig. 10, Georgia),\* or again, as Man-Eagle-Priest (see again figure in January ARCHÆOLOGIST above referred to), the "strong feather or "thumbnail plume"—which "cuts the breaths" of the fiercest demons or "cleaves the strongest storm-wind"—this plume is as prominently represented at the shoulders or outer bends of the wings as it is over the wings of the comparatively modern shield-painting of the Zuñi sky-god *A-tchi-a-lá-to-pa* or the "flint-winged" Man-Eagle of War and the Thunder-bolt. (Fig. 13.) This, then, is a distinctive Indian characteristic, since it may be observed in the paintings or other delineations of eagles (but rarely of other birds), made also by members of several other Indian tribes; hence it serves to identify the composite human-eagle figures in the mound-builder specimens with the simpler eagle figure of the same series. In the latter also (Fig. 3) is an equally

characteristic representation, that of the "umbilical" or "anal mark" (or sign of the "power of the bowels," as it would be called by the Zuñis). By this the figure was made not merely an effigy of the eagle, but also an amulet or



FIG. 12.—Shell engraving probably representing God of the Two Winds.

fetich of him as being a god, for it was supposed (for obvious reasons) that his figure was thereby endowed with the power of continuing the life it gained from the food of sacrifice and slain enemies.†

In the semi-anthropomorphic man-eagle figures, however, this mark is invariably replaced by the loin-cloth, the equivalent human symbol of virility or manhood, as in Figs. 9, 10, 11, and

\* My authority for the use of these terms "Man-Eagle" and "Eagle-Man," has been called in question as possibly un-Indian—"outside of Zuñi." My colleague, the Rev. J. Owen Dorsey, assures me, as does my friend, Miss Alice C. Fletcher, that both terms are in common use as sacred personal names and as names of mythic characters amongst the Omahas and other Siouan tribes, and I find that, as I had supposed, a similar usage prevailing amongst many other tribes, including some even to the east of the Mississippi.

† Thus Zuñi effigies of the animal gods—the fetiches of war and the chase—are supplied with this mark or with the symbol of the heart, or with both, to make them potent or open for them their "passage-way of life." The ornamental bands encircling the tops and bases of their food and water vessels are also left slightly open or spaced, on account of a similar animistic conception of them.

12. This also accords with the idea and usage of the present Zuni and other Indian tribes.

But perhaps the most pronounced, certainly the most conclusive evidence of the mythic and sacred character of these man-eagle figures is found in the fact that each is represented with a mask, the symbol of "transformation," held in the hand (Figs. 10 and 11), to symbolize the *act of transformation* from eagle form into human form or *vice versa*, the mystic power of which these gods were regarded as possessing.

In further proof that this was the meaning intended by the portrayal of these masks in the figures, reference may be made to the simpler eagle form (Fig. 3). Although his cheek is painted with the zigzag "swift line of tears," denoting the sudden doom he as a god of war is able to cause, and although the line of "detachment" crosses his neck to signify his power to change, yet he bears no mask, being as yet *untransformed*; nor are the contending man-eagles (Fig. 9) shown as carrying masks in their hands, but would be found represented as wearing them, were we able to see their faces (unfortunately destroyed), since they were depicted *as already transformed* for mortal conflict.\*

The bearing of these observations on the question as to whether or not the copper and shell arts of the mound-builders, both in de-

sign and workmanship, were indigenous; is important. They show conclusively, I think, that both arts were Indian, and that both were North American Indian.

Thus, some of the copper works may be as ancient as the fondest romanticist could wish, or on the contrary (and some of them probably are), as modern as the days of De Soto; but, whether ancient or recent, they are of Indian origin and neither Oriental, as some have claimed, nor European, as others have naturally been led to infer by the very high degree of workmanship they exhibit and by certain supposedly analogous art traits. I think it has been shown by the foregoing "experimental study" that the beauty and finish of the finest of these specimens might readily have been produced by the mound-builders. I also believe that the designs themselves have been accounted for as pertaining equally to a native, very old, as well as to a more recent indigenous technical art, and as being specifically Indian in respect to both mythic motive and the conventional or artistic expression thereof.

The only figure in the series which seemingly exhibits marked European traits is that of the eagle; but this, also exhibits, as I have shown, very significant characteristics of North American Indian art, and, as indicated by the scallops of the wing feathers, belongs to the very old, native

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\*I would call attention to the fact that these interpretations, while due to the exercise of "imagination," are not fanciful. They represent real Indian concepts, well known to me through having myself been required to perform, according to elaborate ritual and formulæ of the Zunis, the ceremonial of transformation (or exchange of my spirit person) and other like symbolic acts founded upon identical concepts; for it is held by these and other advanced Indians that the dancer in the sacred dramas, after having his face properly painted (see Figs. 10, 11, 12, and 13), can change or transform his personality by simply putting on or taking off his mask, usually with the left or non-combative hand, as in these.

family of Man-Eagles. The bilateral symmetry of this specimen, so suggestive of the heraldic "eagle displayed" (*l'aigle éployé*), is readily enough explained as a technologic feature, the result of pattern tracing; while the "regard" of the bird, the turn of his beak *toward the left*, is decidedly unheraldic; for all charges, on or off of European armorial shields, must "regard the dexter side." Finally, the treatment of the legs and claws of this and other copper eagles also appears heraldic; but while unusual as an Indian mode of treatment in *painted* figures, it is nevertheless Indian; for example, the Zuñis, the ancient Saladeños and the modern Haidas, managed the legs and claws of eagle and composite eagle figures made "in the flat" (or cut out of hide, thin wood or slate) in almost precisely the same manner.\*

There is one characteristic of the composite human-eagle figures which raises the latter, artistically, but not conceptionally, above anything else of the kind in native American art. The Man-Eagles are provided with arms as well as wings, as were those of Assyria, Egypt, and Europe; but this does not prove the designs of them to have been either Oriental or European in origin. It simply demonstrates the artistic capacity of those who fashioned them. The conception was a well-established Indian idea.†

The presence of certain ornate designs in the Moorehead collection, which seem at first "too good" to be Indian, are in form neither different from nor better than excised plates of mica of undoubted antiquity from the mines of the Carolinas. The presence in the same collection of certain

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\* Several questions arise in this connection, among them being: 1. If the hammered or sheet copper articles found almost universally in the mounds were of European origin, why is it that cast-copper objects, being cheaper, more readily made and duplicated by European artisans, and more suitable for certain purposes than if made in the flimsy sheet-copper form, are never, so far as I know, found in the mounds—even heavier work, celts, etc., being hammered, not, apparently, cast? 2. Was there a European artisan of the sixteenth or seventeenth century who could or would have grasped so thoroughly the special Indian spirit of art as displayed in these composite specimens? I find that I cannot reproduce them faithfully unless I recognize just what they expressed, and at least *finish* them with primitive tools. I can copy them otherwise, but my copies are easily distinguishable by marks that only the greatest care can eliminate. 3. The mound-builders had already waned when De Soto reached the Mississippi. He and others saw descendants of them who were still building mounds, it is true, but they were comparatively few. Hence we can expect to find only in comparatively few of the typical mounds any trace of European art, whereas these shell and copper figures are found far and wide. I am here, be it understood, considering evidence as to the date and character of these works in copper and shell rather than as to the date of the decadence of the typical mound-builders, which latter event, I believe, may not necessarily have taken place very long prior to the discovery.

† For example, Zuñis have certainly not borrowed their idea of the Whirlwind God; yet they clearly conceive of him as a being who wears the face of an eagle, has the body, arms, hands, and legs of a man, the claw-feet, wings and tail of a vulture, the feathers of which are filled with "flint sand." Yet when a native artist paints this composite monster, he gives him wings and tail, but no arms and hands (as in Fig. 13). He will tell you that the god, when flying (in which characteristic act he is always depicted), "has to use his hands and arms to help flap his wings withal;" but the plain fact of it is that the Zuñi is not so good an artist as was the mound-builder. One of their best decorators once attempted to draw for my edification an angel like the cherubim belonging to the old Franciscan church of his pueblo. He strove hard to separate the arms from the wings (as he remembered having seen them separated in the statue), but ended by depicting them *laid along the tops* of the outspread wings.



seemingly Oriental symbolic figures may be explained as designs of perfectly natural indigenous growth. Such is the decorated Swastica cross, which, in cruder form among the Sioux, Havasupais, Pimas, ancient Pueblos, and Mexicans, at first simply symbolized the four winds and directions in one as the "all-wind"

bolized the horizon, or the four horizons. When this latter form was made open at the four termini or quarters "to let the winds in" it became the Swastica or, first, the *world-wind* symbol; hence, and second, the sign of the four seasons or year, and finally, as with the Mexicans, of the "year cycle," or time itself!

The art displayed in these mound-builder specimens certainly resembles that of Mexico and Central America. This resemblance is not often detailed and even when so, may be adventitious,\* or it may, to a slight extent, indicate derivation from one or the other of these countries by the mound-builders themselves. There is no inherent improbability in this. Mayas and other Central American peoples were waning when Hernandez de Cordova first penetrated their territory, as the mound-builders were waning when De Soto crossed the Mississippi; yet in Central America, in the sixteenth century, city-builders still lived, as descendants of the mound-building peoples were still building mounds in the time of De Soto; and whilst



FIG. 13.—Zuñi shield painted with representation of the flint-plumed God of War and the Thunderbolt.

sign. It was derived from the earlier symbol of the cross of the four directions, inclosed by a circle or square, which in turn sym-

\*An illustration of this may be seen in the engraving on a shell gorget from Missouri (Fig. 12), which represents, apparently, a God of the Winds—perhaps of the Two Winds, or good and evil breath—and is more or less like a Mexican figure; but this resemblance is merely superficial. As would be the case in a Zuñi representation of the Dawn-God blowing the wind of the morning dew through a flute with a flaring gourd-shell mouth, so this personage is shown as if blowing through a somewhat similar instrument. In the mouth of his mask, or "double," is seen another of these, on the tube of which is cut the zigzag line of swiftness; while in his hand he carries as a baton or perhaps a thunder-mace, what appears to be a third, with the stem marked diagonally, or twisted as if to represent force or violence. If this were a Mexican or Central American figure the wind would be shown by comma-, flame-, or cloud-shaped marks issuing from the mouth of the individual. Again, unlike the Mexican and Central American figures, but typical of other delineations of the mound-builders (Fig. 10), this character wears at his hip a pouch, decked with bosses and plates of copper. All of his other accoutrements, too—copper ear-buttons, the copper crest or comb over his mask, etc.—are crude, but characteristic representations of articles found buried and similarly associated with the dead, in mounds from Ohio to the Gulf, articles as distinctive of the mound-builder Indians as the elaborate plume-dresses, obsidian-spiked war-clubs, dirks and the throwing-sticks of Mexican figures are of the Aztecs. On the whole, this art of the mound-builders seems sufficiently self-centered to stand by itself as well as better-known arts of other ethnic areas of the continent.



the former were unskilled in navigation, the latter were, on the contrary, most noteworthy voyagers in canoes, had some silver, more pearls, and abundant copper. Being such expert navigators in canoes, the enormous size of which astonished the Spanish adventurers and was known even to the far-away Pueblos, could they not well have visited southern peoples and given to them, quite as likely as taken from them, art forms?

The art of the mound-builders is in many details quite as like that of the Northwest coast as it is like that of the South. In other points the similarity is greater, that is, more general, as the clay trenchers (which are obvious survivals of wooden trenchers extremely like those of the Northwest coast) and numerous incised bone tubes will bear witness. Moreover, this resemb-

lance in works of art is nowhere more pronounced, especially in technique, than in the native copper work—undoubtedly pre-historic as an art—of the extreme North-West as compared with that of the Mound-Builders. How is this to be explained? By the theory of independent development, which is probable; or by a theory of common derivation or descent—alike of some of the Mexican peoples (down the Western coast) and of some of the Mound-Builder peoples down the great chain of lakes from Alaska to Lake Superior itself—which is only possible? Yet there are considerations of import in answer to this question, but they belong even less to an experimental study of primitive copper-working than does the latter or analytic half of this paper.

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## THE SHELL BANKS OF PASCAGOULA.

BY CHARLES E. CHIDSEY.

THE only extensive remains that we have of the aborigines who once inhabited the Gulf coast are the shell banks or shell mounds that are so numerous at Pascagoula and vicinity ranging everywhere from the size of a tub to the once gigantic heap of Bayou Codou, Ala. Nearly the whole river front of the town of Scranton, Miss., is a series of shell banks varying in thickness from six inches to ten feet or more and from five to fifty feet wide.

Some idea of the antiquity of these heaps may be obtained from the live oaks (*quercus virens*), measuring from four to five feet

in diameter, growing upon them. These heaps are composed almost entirely of clam shells; very few oyster shells are found upon them except near the surface, though at times we find a sprinkling of oyster shells at the bottom of the heaps as an exception.

That these heaps are mere refuse piles or heaps of debris thrown out before or around the wigwam door is evident from the large quantities of bones of fish and various animals besides parts of charred wood that are found in them.

Often when excavating shell heaps I have found bunches of shells that have been burnt into

lime, with fragments of burnt wood, broken pots, pieces of charcoal mingled with the bones, and scales of fish showing that the savages had here built their camp-fires and feasted off the game that they had caught. But these heaps were sometimes used for burial purposes.

One of the heaps on the Pascagoula river front that now serves the useful purpose of a vegetable garden was once an aboriginal cemetery, as is evident from the large quantity of human skulls and bones that have been found in it. Out of this same heap were taken a large number of small images of burnt clay and stone, some of them bearing a striking resemblance to the pictures we see in magazines of the Egyptian mummies. There were also found some pieces of flint that the savage artist had endeavored to carve into a human likeness, but had left his work unfinished. With them were pots, pipes and arrow-heads of flint and basalt.

Early in the summer of 1889 Messrs. Hunter, Benn & Co. opened one of these banks on the river for the purpose of laying the foundation of a saw-mill. In the work they uprooted a live oak tree some two feet in diameter, and underneath its roots was found the skeleton of a woman, or a youth, with some pots that were broken by the picks of the workman. Owing to the fact that the body was near the surface and that no precautions were taken (such as were usual with the aborigines, to prevent the removal of the dead) I am of the opinion that this body, as also those found in the garden cemetery aforesaid, was hastily buried.

I am strengthened in this opinion by reading M. D'Ibervill's Journal that on his visit to Pascagoula, July 1700, he found the place deserted, but on sailing farther up the river, he found two old Indians who told him that the people had all been exterminated by a pestilence. Be this as it may, it is a significant fact that simultaneously with the opening of this shell bank an epidemic of typhoid malaria broke out in the town of Scranton and continued with unabated rigor during the entire summer and fall. At no other time during the fifteen years that I have lived here has the town received such a visitation.

I have taken from the shell banks of Pascagoula fragments of burnt pottery that had the basket markings, showing that the maker had made the pot in a basket which he had then burned away. I also found one huge fragment of a bowl that had a beautiful incised scroll mark like the specimens found in the mounds near Charleston, Mo. (65,501 Smithsonian collection, *Ethnological Report*, 1881, page 503, figure 1889). Mr. H. E. Richardson, of this place, gave me a fragment of a pot that he found near the mouth of the Pascagoula river containing an incised carving of the head of a jay bird with tuft erect. The workmanship on the fragment is so artistic, and shows such a correct knowledge of form that I doubt if it can be the work of any of the tribes that inhabited Pascagoula. I am inclined to think that it came from further south. All of the above articles I have deposited in the Smithsonian Institution. About one mile from

Scranton on Krebs' lake is a shell heap that covers about  $\frac{1}{16}$  of an acre. It is said that its summit is twenty-two feet above low water mark, but I think it less. On it stands the old fort built by the French emigrants under De La Point in 1711. From this heap I have taken pieces of pottery that contain minute fragments of shells. On showing them to Dr. Hinsdale he told me that there was a deposit of this kind of clay near Point Caddy, Biloxi. From these the tribes of the Pascagoula must have obtained this pottery, as no such deposit of clay is known anywhere in the neighborhood of Pascagoula. The most interesting of all the shell banks that I have observed in the neighborhood is the one at West Pascagoula. This is a large wall or mole that intersects a marsh on the banks of the West Pascagoula river. It is one hundred and twenty paces long by twenty to fifty wide and four feet in height. What motive the aborigines had in building this mole into the water (the marsh is of recent formation) unless it was to make a convenient landing place for their canoes I cannot imagine. That it was not a mere accumulation of debris, I think, is evident, as it is built straight into the water running with perhaps a slight variation due east and west. This wall, like the banks of East Pascagoula and on Krebs' lake, is composed almost entirely of clam shells of a small species, none of them being larger than a silver dollar. At the mouth of East Pascagoula river is a large shell-heap which is, unlike the heaps higher up the river, and at

West Pascagoula, composed of oyster shells. Here an interesting fact is presented. Clams are seldom found on the reefs of Pascagoula, though oysters exist in inexhaustible quantities.

Hasty generalization in science, as all things else, should be avoided, yet the conclusion forces its self upon me that those made from clam shells are much the oldest; and that clams began to disappear from our waters before the oyster became a permanent resident. This last mentioned heap is situated on a small point of land that juts out in the Pascagoula river. This point has only within my own recollection become connected with the main land by the sand and debris that has been washed up by the sea. In several places where I have excavated this heap, I have found it resting on a sandy beach beneath the low water mark. That this is a refuse heap is evident from its irregular size and shape, and the fragments of bones and pottery and burnt wood that I have taken from it. D'Iberville, in his Journal, tells us that on his visit to Pascagoula in July 1700, he found a fort situated at the mouth of the river. I am satisfied from careful observation that this heap is the location of D'Iberville's fort. There is one other heap that I will call attention to, and then bring this paper to a close. Between East and West Pascagoula rivers (about three miles apart here) there is a vast extent of salt marsh, intersected by lakes and bayous, the whole covering some 30,000 acres. About the centre of the marsh is a small shell heap probably fifty feet in diameter, and four or five

feet above the level of the tide. The curiosity of this heap is, that there is no land within less than a mile and a half, though there are similar heaps within half a mile of this one. All of them are covered with a heavy growth of candleberry myrtle and Spanish bayonet. The U. S. geodetic survey of eighty years ago, shows that where now is a large extent of marsh was only the real estuary of the Pascagoula. Such being the case, it is clear that these heaps, as also the one I have mentioned as being at the mouth of the Pascagoula, were built in shallow water upon sand bars. I am of the opinion that where these heaps now are, some of the aborigines had their habi-

tations built on pilings and these heaps are mere piles or debris that were accumulated round and under the dwellings. I cannot assign any reason for their building over the water. The existence of arrow-heads of flint and basalt in the heaps, is sufficient evidence that the aboriginal inhabitants of the Gulf coast carried on a commerce with the more Northern tribes. If we except the small pebbles that are only found in heaps of drift some thirty-five miles north of Pascagoula, no flint or basalt exists in this neighborhood. I do not think that such materials can be found nearer than the Tennessee mountains.

## ANTIQUEITIES OF BOONE COUNTY, MISSOURI.

BY WALTER H. FICKLIN.

IN Boone county, one and one-half miles Southeast of Columbia, in section 19, township 48, range 12 West, is a peculiar mound, which with three others, is situated on the verge of a cliff, about two hundred yards below the bridge, on the Ashland road, over Hinkson creek. The largest of these mounds is fifty feet in diameter and four and one-half feet in altitude, and is covered with small trees.

Under a thin covering of soil was a layer of flat stones which bore no marks of fire. Beneath these stones occurred three feet of burnt clay, which, from all indications, had remained undisturbed until the mound was explored in 1893. In my collection are two pieces of this burnt clay, each being as large as a man's

head. At the original surface of the ground, a few bone fragments were found, but there were no traces of pottery.

The peculiarity of this mound is, that excepting the layer of stone, it is composed almost entirely of burnt clay. Of this group the mound described is the only one worthy of mention; the others being the ordinary round mounds of this locality.

Two miles Southwest of Columbia, in the Southeast corner of section 22, township 48, range 13 West, occurs a solitary mound, situated on a high bluff overlooking Hinkson creek. This mound is forty-eight feet in diameter and four feet in height.

In August 1893, in the presence of Prof. G. C. Broadhead, this mound was thoroughly excavated.



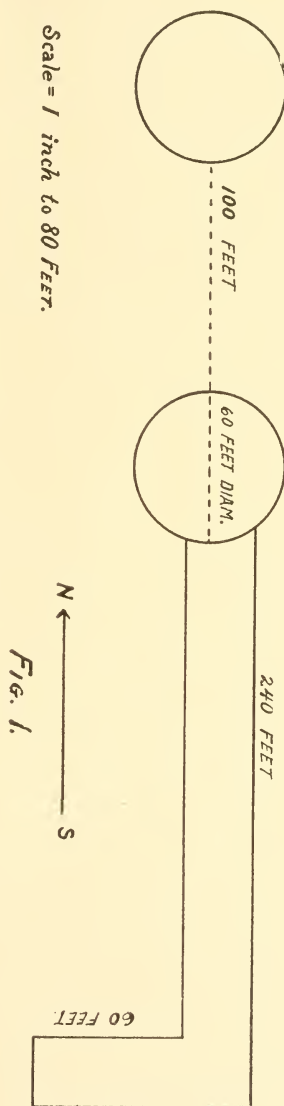
Bones were uncovered at the first shovelful, and from the top of the mound to the original surface of the ground, there was a mass of bones, etc., in the utmost confusion. Some of the bones had been very badly gnawed. Near the North side of the wall was found a greenstone celt, finely polished, and bearing evidence of much usage. Near the east side occurred the remains of three earthenware vessels. The fragments of one of these vessels were so intermixed with the skull bones of a child as to make one believe that the pot was placed over the child's head at the time of burial. Near the west wall were found three pipes, both valves of a large mussel shell, and fragments of an ornamented earthenware vessel. Two of these pipes are in my possession; the other, together with the above mentioned celt, belongs to Prof. Broadhead.

Throughout the mound occurred little pockets of burnt clay containing fragments of bone.

The wall in this mound was compactly built of flat stones; was three feet high; and the enclosed space was an irregular quadrangle in shape; three of the sides being eight feet in length, the other, nine feet. No regard was paid to the points of the compass.

In the Northeast corner of section 5, township 48, range 13 West, one mile Northeast of the bridge, across Perche creek, on the Rocheport road, on some land belonging to Robert Ravenscraft, are two large mounds, each sixty feet in diameter and seven and one-half feet high. These mounds are one hundred feet apart and occupy a North and South line.

William H. Ravenscraft, the present occupant of the farm, says that formerly there was a paved way, thirty feet wide and composed of large flat stones, which led two hundred and forty feet due south from the south



mound, and thence due west sixty feet. This way was removed about fifteen years ago on account of interference with cultivation; however, enough remains to trace its course easily and to measure its dimensions. In the removal of the stones several human skeletons were uncovered, but were not preserved. Figure 1 represents this interesting structure as Mr. Ravenscraft describes it.

During my visit to this place I found several human teeth, fragments of bone, and flint implements, and shells scattered over the field in which the mounds are situated.

In section 22, township 48, range 12 West, on land belonging to Mr. T. J. Johnson, is a large mound seventy-five feet in di-

ameter and is now seven feet high; Mr. Johnson says that three feet have been plowed.

This mound was opened in August 1893. One foot below the surface was a large skeleton. Among the bones were found a dagger-like implement, an arrow point, and a sandstone polishing implement. Two feet below the skeleton was a two-foot layer of large flat stones very firmly laid; in fact these stones were a serious obstruction to exploration. Under them occurred badly decomposed bones intermixed with flint flakes, implements, and fragments of unornamented pottery. The layer of stones was probably the roof of a vault; however, the excavating was not pushed far enough to prove it.

## THE SIOUX MESSIAH.

BY THE EDITOR.

I DO not claim to be an ethnologist and my observations at Pine Ridge during the singular Messiah Craze have but little ethnological value. It was a great opportunity for an ethnologist and I could never quite understand why Miss Fletcher, or Mr. Mooney or Dr. Dorsey, or some one else, did not visit the Reservation in November-January ('90 and '91) and study the new religion.

As no one was present especially interested (save a corps of "war correspondents," and their testimony is sensational and incomplete), I have made bold to present the Ghost Dance and attending ceremonies as I saw them.

The second of December I made a contract with the *Illustrated*

*American*, of New York City, to go to Pine Ridge Agency and study the Messiah Craze, reporting to the publishers upon such phases of the "outbreak" as might be of interest to the public. As a result, six articles appeared in the *Illustrated American* in 1891. They were copied extensively over the country and being both political and semi-scientific not a little discussion arose among the journals of both political parties. The music of the dance was the first published, and it has since been used by various orchestras, etc.

Upon arriving at the Agency I employed George Bartlett (Husté) and Henry Hunter (Itonkasan, the Weasel) as interpreters. The former has been with the Ogallala Sioux twenty years, and has seen

much service. The latter is a half breed of some intelligence. With them for five weeks I visited camps about the reservation and collected much valuable data, together with a series of photographs. Some of our experiences (the troops and Sioux were skirmishing) were decidedly adventurous.

As Mrs. Eastman has given a general account of the Messiah Craze, I shall treat of the Dance itself and then sum up the causes which led to it. I quote at length from the *Illustrated American* of January 17, 1891 :

"The largest camp of the dancers prior to the departure for the North was located upon Wounded Knee Creek. Other camps of considerable extent existed upon White Clay Creek, four miles from the agency headquarters, upon Porcupine and Medicine Root streams. \* \* The earth is packed as firm as a cemented cellar bottom, so rendered by the hundreds of feet that stamped furiously upon the surface, and for a space of three hundred and fifty feet in diameter there is not a vestige of grass, nor the indication of the smallest shrub.

"When the medicine men took the Ghost Dance under their charge one man was appointed "High Priest," to have entire control of the ceremonies. His four assistants were likewise invested with power to start or stop the Dance at will. They were given authority to punish any person who should refuse to obey their commands.

"While the priests are employed in their prayers, the squaws make a good-sized sweat-house. \* \*

Poles are stuck in the ground and the tops bent together and securely tied. These saplings are strong enough to bear the weight of several hundred pounds. Over the framework are heaped blankets and robes to such a thickness that no smoke or steam can pass from the interior. A fire is started in a hole in the ground several feet from the small entrance to the sweat-lodge, and twenty or thirty good-sized stones are placed therein to be heated. When these rocks have become sufficiently hot, the young men who are to partake of the bath, strip, with the exception of the breech-clout, and crawl through the door. They seat themselves in a circle, with their feet toward the centre and their backs against the sides of the lodge. The attendant shoves some of the hot stones inside, and the young men pour water from a hide-bucket upon the little stone heap. Steam and vapor arise, completely filling the enclosure. The attendant has meanwhile covered the opening so that no air from the outside may penetrate. As the vapor condenses, the attendant thrusts more stones within, and thus the operation is continued as long as the youth can stand the confinement. The pipe is also smoked during the sweat. When the young men issue from their bath the perspiration is fairly streaming from every pore. If it is not cold weather they plunge into a pool in the creek near by ; but if it be chilly they wrap blankets about their bodies. None of the whites and half-breeds who have witnessed these things ever saw a Sioux rub himself after issuing from the bath.

"Several sweat-houses are erected in order to prepare the young men for the dance. When a good number of young men, say fifty or sixty, have thus prepared themselves, the high-priest and his assistants come forward. The high-priest wears eagle-feathers in his hair, and a short skirt reaches from his waist nearly to his knees. The assistants are dressed in a similar manner, but wear no ornaments other than the eagle-feathers. The dancers wear no ornaments whatever, and enter the circle without their blankets, many of them only wearing their ordinary clothes.

"That Indians should lay aside all ornaments and finery and dance without the trappings which they so dearly love, proves conclusively that some powerful religious influence is at work. In their other dances, the Omaha, the Old Woman, the Sun and War Dances, feathers and bangles, weapons, herbs or painted and plaited grasses, porcupine quills, horses' tails and bits of fur-skins, necklaces, bells, silver disks, etc., are worn in great profusion.

"The candidates for 'conversion' do not fast, as has been stated by several writers who have not thoroughly investigated this subject. After they have come forth from the sweat-house they are ready to enter the sacred circle. The high-priest runs quickly from the village to the open space of ground, five or six hundred yards distant, and, stationing himself near the sacred tree, begins his chant, as follows :

"Hear, hear you, all persons !

Come, hurry up and dance, and when you have finished running in the circle, tell these people what you have seen in the spirit land.

I, myself, have been in the spirit land and have seen many strange and beautiful things,

all of which great Wakantanka rules over and which my eyes tell me are good and true."

"As the speaker proceeds, the men and women leave their tepees and crowd to the dance-ground. They form two or three circles, according to the number of persons who wish to participate, and, grasping hands with fingers interlocked ('Indian grip'), the circles begin to move around toward the left. They rub their palms in dust or sand to prevent slipping, for it is considered unlucky for one to break connections.

"The sacred tree needs a few words of explanation. It is a nearly straight sapling thirty or forty feet high, trimmed of branches to a height of several feet. To the topmost twigs is attached a small white flag or canvas strip, supposed to be an emblem of purity, together with some of colors. The base of the tree is wrapped with rushes and flags to a thickness of about five feet. Between the reeds the dancers from time to time thrust little gifts or peace-offerings. These offerings are supposed to allay the anger of the Great Spirit, and are given in perfectly good faith by the poor natives. They consist of small pieces of calico, bags of tobacco or pipes. During the heat of excitement, those worshippers most deeply affected cut small particles of flesh from their arms, and thrust these, also, between the rushes of the holy tree.

"Henry Hunter (the Weasel, 'Itonkasan') informs me that after the dance had been running some days, the rushes covering the base of the tree were literally besmeared with human blood !

"As the circle moves toward the left, the priest and his assistants



cry out loudly for the dancers to stop a moment. As they pause he raises his hand toward the West, and, upon all the people acting similarly, begins the following remarkable prayer :

“Great Spirit, look at us now. Grandfather and Grandmother have come. All these good people are going to see Wakantanka, but they will be brought safely back to Earth. Everything that is good you will see there, and you can have these things by going there. All things that you hear there will be holy and true, and when you return you can tell your friends how spiritual it is.”

“As he prays, the dancers cry aloud with all the fervor of religious fanatics: They moan and sob, many of them exclaiming: ‘Great Father, I want you to have pity upon me.’

“One can scarcely imagine the terrible earnestness of these people. George E. Bartlett, the United States Deputy Marshal of this district, and Mr. Sweeny, one of the agency school-teachers, the chief herder, Mr. John Darr and others, have informed me that during their extended experience on the agency, of many years duration, they have witnessed many of these dances. They describe the scene of the dance, especially at night, as most weird and ghost-like. The fires are very large, and shed a bright reflection all around. The breasts of the worshippers heave with emotion; they groan and cry as if they were suffering great agony, and as the priest begs them to ask great Wakantanka to forgive their sins, such a cry of despair and anguish arises as to deeply affect even the whites present. Bartlett said that, in his opinion, men could not be more in dead earnest nor pray harder than did these poor children of the plains.

“After prayer and weeping, and offerings have been made to the

sacred pole, the dance is started again. The dancers go rather slowly at first, and as the priests in the centre begin to shout and leap about, the dancers partake of the enthusiasm. Instead of moving with a regular step, each person jumps backward and forward, up and down, as hard as he or she can without relinquishing their hold upon their neighbor's hand. One by one the dancers fall out of the ranks, some staggering like drunken men, others wildly rushing here and there almost bereft of reason. Many fall upon the earth to writhe about as if possessed of demons, while blinded women throw their clothes over their heads and run through brush or against trees. The priests are kept busy waving eagle-feathers in the faces of the most violent worshippers. The feather is considered sacred, and its use, together with the mesmeric glance and motion of the priest, soon causes the victim to fall into a trance or deep sleep. Whether this sleep is real or feigned the writer does not pretend to say, but sufficiently deep is it that whites visiting the dance have been unable to rouse the sleepers by jest or blow.

“Unquestionably the priests exercise an influence over the more susceptible of the dancers akin to hypnotism. One of the young men, who danced in the ghost circle twenty times, told me that the priest :

“‘Looked very hard at us. Some of the young men and women could not withstand his snake-like gaze, and did whatever he told them.’

(*To be concluded.*)

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## EDITORIAL.

WE wish it could be indelibly impressed upon the minds of collectors (especially dealers) not to destroy archæologic testimony. There are continuously coming into this office articles and letters regarding finds. We are very glad to receive them, and thank our friends for their efforts. But there are regrets which must accompany many of the acknowledgments.

If one knows nothing of field work, or cannot appreciate the importance of what he finds, he should never attempt exploration. A collector not familiar with the proper opening of a mound, will never find *all* that is in the structure. The chances are favor-

able that he will not find enough to pay him for his work. Not one collector in a thousand ever opened a mound thoroughly—usually he digs a little hole from the summit downwards. Four-fifths of the base line of the structure are not affected by his exploration. Some of the richest finds in Ohio have been made in mounds which have been previously opened in just such a manner. The collector secured little or nothing, and later the practical explorer got everything.

Mounds and graves are fast vanishing. Every year more and more are destroyed. We should all unite in preserving them, or, if they must be explored, in doing the work in a proper manner. It is of vital importance to American archæology that this work be done thoroughly and intelligently.

Let readers take this advice to heart. We do not mean your fellow collector, John Smith, we mean *you*. If *you* destroy these ancient remains solely for the relics they contain you commit a crime against science.

FRAUDULENT relics have again come into prominence. We would not notice the complaints were it not that some beginner or interested person not a collector might be deceived. Several relics have been sent out from Flag Pond and Johnson (both in Scott county), Virginia. They are most crudely made, and exhibit designs seldom, if ever, employed by pre-Columbian Americans. Nearly all are exceedingly grotesque, and carry the stamp of counterfeit too

plainly to lead the experienced collector astray.

Flag Pond and Johnson are small, wretched Virginia swamp towns. Both are fifty years behind the times. Judging from the orthography and the tone of the letters sent out by the makers of these relics, the guilty parties are ignorant and dull. Probably the makers do not know the types which prevail throughout the Mississippi Valley. We doubt if either of them ever saw a genuine effigy pipe or a slate ceremonial. Such men are not dangerous to any but beginners, and it is hardly worth while to do more than caution readers against the towns named. Dealers and editors have exposed them several times, and if any person is "taken in" he will have no one to censure but himself. There is much more need of exposing those who destroy valuable scientific testimony, open mounds and graves for relics alone, than hunting frauds. The dealers in relics have "a hard row to hoe" in any event. None of them make money. It would not pay them to make relics for sale—even the genuine specimens are extremely hard to sell.

The two relic makers of Johnson and Flag Pond are rough, uneducated, blundering rascals. They went into the relic business as a side issue to their regular occupation, viz., ginseng digging and "razor-back" raising. Collectors need have no fear of them. The fever and ague of Flag Pond will carry them off in due season. We had far better watch the sleek, sharp rascals in our midst.

THE Egyptian Exploration Society merits the support of all

intelligent people. Its work during the past few years has done much to clear up early Egyptian and Assyrian history. Especially do recent discoveries bear upon the Old Testament, and as a natural consequence Bible students, historians and scientists of the world have been watching the reports of the Exploration Society. Readers of the *ARCHÆOLOGIST* interested in Egyptian and Biblical Archæology should write to Rev. W. C. Winslow, 525 Beacon street, Boston, Mass., for information regarding the reports of discoveries.

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### BOOK REVIEWS.

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Publications received:

- "The Earth the Home of Man" (pamphlet), by W. J. McGee.
- "Dust from an Old Indian Trail" (pamphlet), by Irving W. Coates.
- "The Indian and the Pioneer; an Historical Study," by Rose N. Yawger. C. W. Bardeen, publisher, Syracuse. \$1.50.

This volume more properly belongs to history (popular)\* than to ethnology. It scarcely comes within the range of an ethnologist's reading. It is of interest to the student of history; but to the specialist in early American history its citations are quite familiar. It treats particularly of the tribes of New York State, with a little description of and reference to the red man of Pennsylvania, Ohio and New England. As a whole, the book is of value to students seeking information and knowledge. The style is good; the writer being possessed of considerable power.

- "Nagualism, a Study in Native American Folk-Lore and History," by Daniel G. Brinton. David McKay, publisher, Philadelphia. \$1.00.

One always picks up a new book by Doctor Brinton with pleasure, and in this, his latest, one is not disappointed. Little has

been authoritatively said regarding the magic, the "black art" of the Mexicans and Mayas. "Nagualism" treats fully of the practices, the beliefs and the ceremonies of Central American tribes. To one knowing little of the subject the book seems weirdly fascinating. Here are several striking passages :

"The Nagual is generally an old Indian with red eyes, who knows how to turn himself into a dog; wooly, black and ugly. The female witch can convert herself into a ball of fire; she has the power of flight, and at night will enter the windows and suck the blood of little children." \* \* \*

A woman Nagual once visited the Abbe Brasseur de Bourbourg, and Dr. Brinton quotes from the Abbe as follows :

"She wore a piece of light green stuff loosely folded around her form at the hips, and falling to a little distance above the ankles. A jacket of red silk gauze with short sleeves and embroidered with gold clothed the upper part of her person, veiling her bosom, upon which lay a chain of heavy gold pieces, pierced and strung on a cord. Her rich, black hair was divided on the forehead and drawn back in two splendid tresses fastened with blue ribbon, while a white muslin 'kerchief encircled her head like the calantica of the ancient Egyptians. Never in my life have I seen a more striking figure of an Isis or a Cleopatra. There was something strange in her expression. Her eyes were the blackest and the brightest in the world; but there were moments when she suddenly paused, leaned against the billiard table or the wall, and they became fixed and dead like those of a corpse. Then a fiery glance would shoot from beneath her dark lashes, sending a chill to the heart of the one to whom it was directed. Was it madness, or was it, as those around her believed, a momentary absence of soul; an absorption of her spirit into its nagual; a transportation into an unknown world? Who shall decide?"

The Doctor says that nearly all the insurrections against Spanish rule in Central

America had their origin in Nagualism.

"The conclusion to which this study of Nagualism leads is, that it was not merely the belief in a personal guardian spirit, as some have asserted; not merely a survival of fragments of the ancient heathenism, more or less diluted by Christian teachings, as others have maintained; but that above and beyond these, it was a powerful secret organization, extending over a wide area, including members of different languages and varying culture, bound together by mystic rites, by necromantic powers and occult doctrines; but, more than all, by one intense emotion—hatred of the whites—and by one unalterable purpose—that of their destruction, and with them, the annihilation of the government and religion which they had introduced." W. K. M.

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"Prehistoric Naval Architecture of the North of Europe," by George H. Boehmer, Smithsonian Institution.

Once in a while is brought before the archæological world a production of great merit. This can certainly be said of the monograph having the above title. The author has surely done himself great credit in its production. It is learned, and shows much research. His authorities are many, numbering hundreds, and no student of Archæology should be without it. He begins with a description of the vessels of Egypt, Greece, Rome and other ancient countries, and appears to think that although these people had to be their own teachers because of short, chopping waves, sudden changes of wind, tremendous storms, shoal shores and sand bars in their northern seas, yet there lingers something in the naval structures of the Scandinavians indicating that the people of the South did have a tendency to influence these Northern nations in the construction of their vessels.

The writer's description of the discovery of many of the ancient vessels, some of which were merely dug-outs or boats made from the trunks of single trees, is interesting and fascinating. An immense boat of this



kind was discovered in May, 1886, at Brigg, Lincolnshire, England, and is forty-eight feet eight inches long, five feet wide, and two feet nine inches deep.

The finer and larger vessels, really ships, appear to have been discovered in Scandinavia. The Viking boat shown at the Columbian Exposition in 1893, is a facsimile of the Gokstad ship found in Norway and now on exhibition in the Archæological

Museum of the Royal Fredericks University, Christiana. An excellent description of this discovery is given by Mr. Boehmer.

The monograph is embellished with many fine figures and numerous plates. This subject is far from being exhausted, and we hope the author may in the near future produce for the benefit of students an equally valuable work.

A. F. B.

## COLLECTORS' DEPARTMENT.

### PUEBLO GRAVES.

An interesting communication has been received from Mr. A. L. Heister. The editor regrets that lack of space prevents the publication of the entire article.

The gentleman states that he has made a number of wonderful discoveries, in company with several others who have been associated with him in his work. The illustration accompanying the article is taken from several sketches which were made by Mr. Landon, and shows the characteristic ancient Pueblo pottery of New Mexico. He has been engaged in excavating among the ruins of the southwest for about two years, and gives it as his opinion that the relics and habitation sites are almost numberless. If Mr. Heister would carefully follow the review of Baron Nordenskiöld's book he would find therein many questions solved which are enigmas to him. We quote from him as follows :

"Here among the beautiful San Francisco mountains, on the head waters of the Gila river, are to be seen the wonderful ruins of the habitations of prehistoric man. The outlines of walls can be traced by an antiquarian. Fragments of pottery and an occasional arrow point of obsidian, agate or flint are all that might attract the inexperienced eye."

Large pine and juniper trees grow upon the walls, and their roots penetrate the rooms of the graves, thus destroying many of the vessels and vases. He says that directly underneath the trees he finds skeletons and pottery, trinkets of bone, sea shells, slate, turquoise and agate ornaments,



and beads; also, that the sand has been shifted by the severe winds of the Southwest, until many of the ruins present the appearance of mounds. Vegetable mould

also covers the rooms, and there is an abundance of brush, cactus and mesquite. He describes two circular depressions which Mr. Cushing would properly call *estufas*.

"A few days ago I stood upon the highest point of an immense ruin. There to the south are two great sinks about thirty feet in diameter, surrounded by circular walls of stone. Almost in the center of the ruin proper is a square court 20 x 25 feet. On all sides of this inner court are rooms about 10 x 12 feet square to the number of more than ninety. On the east is a large court or plaza 50 x 80 feet. This ruin covers over an acre, and is certainly a wonder.

"The ruin from which the pottery here shown was taken is located on Apache Creek, eight miles above Joseph, Socorro County, New Mexico. It consists of about forty-five rooms; two small inner courts and one large outer court. Also two large circular-walled sinks or depressions.\* The entire ruin has been surrounded by a wall of stone, the top line of which is plainly traceable. These people were, doubtless, sun worshippers, as the bodies are all buried heads to the East, or with the face towards the rising sun. The skeletons were found about nine feet deep. On either side of the skull, and near the neck or arms, were found the pottery with some trinkets of bone and stone. The pitcher with handle is a beautiful red, ornamented with black. It will hold one-half gallon. I also found a globe-shaped vessel with small handles on top. It is a bluish white, painted with black figures. It is about nine inches in height, and is ornamented by delicate corrugations or indenture work, defying imitation. Its capacity is about half a gallon."

### RECENT FINDS IN UTAH.

In the region of Southern Utah, famed for its cliff houses, and valley and Mesa ruins, we have recently made interesting discoveries, which would tend to prove the

existence of an earlier tribe of Indians than those formerly occupying the cliff houses.

One special cliff house, beneath which we found these evidences of early occupation, consists of two rooms on the ground floor, and two more on the ledge above. The walls are only a few inches in thickness, and the construction is inferior to those found in the Mancos Canon. We found nothing in the rooms. The relics uncovered in the loose debris on the outside, were readily distinguished from the relics of the earlier tribe.

Two feet below the lowest remains of the Cliff Dwellers, we have found remains of quite a different tribe.

This difference is determined by the shape of the head, which is natural, long-headed or dolicocephalous. The Cliff Dwellers, as we find them, have a perpendicular flattening at the back of the head, making it artificially brachyphalous. We have taken ninety-two skeletons from the cave at depths varying from four and a half to seven feet, including three cliff-dwellers lying at a depth of from two to three feet. In the central portion of the cave the skeletons were lying close enough to touch each other.

The first excavation penetrated three feet of loose debris and waste from the still existing cliff houses. Their foundation walls are not less than three feet above many of the skeletons. The lower four feet in which we have worked is clean, yellow sand, except where discolored by burials. There are a few indications that the bodies found were buried in wrappings of feather, rabbit fur and buckskin; near them are baskets, spear points, bone awls and ornaments, but no pottery.

The number of skeletons found at one level and in one place, would suggest a sudden and violent destruction of a community by battle or massacre. Many of the skulls are broken, as well as the ribs, and the bones of the arms and legs. In the backbones of two different skeletons we found the ends of spear points firmly im-

\**Estufas* (Editor.)

bedded ; in one case the break in the bone was partially healed, showing that the person must have lived for some time after the wound was inflicted.

This is, by far, one of the most interesting collection of human remains of a single tribe yet found in America. Each skeleton, carefully studied, reveals the manner of death. We found one interesting group, a mother with an infant on each arm, and another lying on her breast with its head under her chin. There are warriors, "mighty men of valor," with ten or twelve spear points lying near ; younger men with bone tools near them, and the unwarlike counsellors or priests, with decaying baskets originally filled with food, or possibly tools of trade. These latter have left little trace save a dark stain in the sand.

A careful record has been made of the work, and photographs taken of the better preserved groups and skeletons. Negatives have been developed on the spot, so that there should be a certainty of success.

Later there will be more to tell of this important discovery. H.

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The various newspapers of the United States during February and March printed several hundred articles and news items regarding ethnologic and archæologic matters. More than two hundred were sent to the *ARCHÆOLOGIST* through our New York agent.

We refer to several of the most important :

The finding of skeletons in a cave near Humbolt Lake. No details were given.

A discovery of several stone graves and relics at Elmville, Highland County, Ohio, by Warren Cowen.

The exploration of a mound near St. Joseph, Mo., and an account of some twenty bodies and several hundred relics which were found therein.

Twelve notices (exaggerated) of buried "cities" in the Southwest. Newspaper men love to picture the "civilization of the lost tribes" of Arizona and New Mexico.

It is singular how any person of common sense can see "a vast ruined empire" in an old, tumbled-down pueblo, or a few boulder ruins.

The usual "seven-feet high skeletons" from various gravel pits, mounds and graves. There are quite a number of these notices. The two following are the most interesting of all which have appeared during the month of March :

#### GRAVES ALONG THE OHIO.

Steubenville, O., March 30.—An Indian earthwork has been discovered on the farm of William Medill, in Warren township, this county, inclosing eight acres in the form of a square. One corner fronts on the Ohio river, and here was the entrance. The embankment inclosing the fort is now two and one-half feet high, having been reduced by plowing in late years. Immediately north of the entrance stands a mound ten feet in height, on the top of which is a large oak tree and the stumps of two others.

In digging they first removed about one foot of sandy loam ; then came three layers of flagstones about three feet long by two feet broad. These were laid over the tops of the graves.

Their removal revealed a perfect stone vault about five feet long by three feet wide made of flagstones. Inside of the vaults were found the bones of Indians, with copper needles, spear-heads, polished stones, flint knives, brown mica, stones containing mica and a ball of reddish-brown material. The vaults lay east and west, and the Indians were placed in a sitting posture facing the east.

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#### A HUNT FOR CLIFF DWELLERS.

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INTERESTING SCIENTIFIC EXPEDITION TO MEXICO  
SOON TO BE UNDERTAKEN. /

Carl Lumholtz who is about to head another expedition, which has been arranged for the benefit of the University of Pennsylvania and New York Museum of Natural

History, by a number of archæological students. The expedition, it is understood, will enable a continuation of the investigations made by Prof. Lumholtz about a year since into the habits of the Tarahumare Indians of the Sierra Madre, in the State of Chihuahua, Mexico, in his search for the scattered remnant of the prehistoric Cliff Dwellers, whom Lieutenant Frederick Schwatka believed to be still living in the mountain fastnesses, shrinking from all contact with civilization and adhering to their ancient customs and residences, carved in the rocky faces of inaccessible precipices.

Though much new information concerning the Sierra Madre region and its people, and many specimens of their productions were gained by the explorers, the expedition was a disappointment in the main object sought. While the Tarahumare people were found living in caves during a portion of the year, when the rainy season kept them from the fields, they gave no evidence of ever having possessed the high grade of civilization ascribed to the ancient Cliff Dwellers of Arizona and New Mexico.

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## INFORMATION FOR COLLECTORS.

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*(Continued.)*

With the exception of the finer pipes, there is no class of relics that appeals to the collector, especially to the amateur, as do the beautiful specimens that must be considered ornamental or emblematic in character. They run through a wide range of form and material, though most of them are of the finest or most beautiful stone that was accessible to their fabricators. Many attempts have been made at a classification of these relics, but all have met with the insuperable objection, that, with very few exceptions, we are entirely ignorant of the uses to which they were put, and, consequently, have no starting point from which to extend our system of nomenclature. Even an attempt to name a few of the

simpler forms presents a difficulty almost at the outset; for the different patterns graduate into each other imperceptibly, and there is no certain line of separation between specimens, which are at first glance entirely distinct from one another. For example, as little as the flat, rectangular gorgets and the thin, hollowed, boat-shaped stones resemble each other, there is no possible gradation between the two shapes that may not be found in any tolerably well-equipped museum. Even the cylindrical tubes and the thin, shapely "butterfly banner stones" may form the extremes of a series that shade into each other so insensibly that it is impossible to say where the one shape begins and the other ends. A multitude of names have been invented by various authors under which they have attempted to bring hundreds of different things into one general system, but most of these terms are, and must be misleading in their character; for, as a rule, we have no means of knowing to what use the specimens were put by their makers. To call the flat, perforated stones "gorgets" because they are frequently found on the breasts of skeletons, and therefore probably answer the purpose for which such things have been worn in recent times, may be correct: but we have no warrant for saying that it *is* correct. We do not ourselves now make or use things so similar to the relics of our predecessors that we can classify our collections in the light of present knowledge; we can not even say what we would probably do with such articles if we made them, because we do *not* make them, and, for the most part, never have made anything like them. It would be a great help, not to collectors alone, but to the science of Archæology, if some one competent for the task would establish an arbitrary system of nomenclature for all these things whose use is, and no doubt always will be, unknown. Such a method would be no more inexact than that which we are now compelled to use, and would at least have the merit of enabling one to understand to what an



author referred when he used a particular term for a particular specimen or type. We do not have this knowledge at the present time, for every writer on the subject has his own way of designating whatever he wishes to describe, and thus we may have the same name given to two things that are entirely different, or have names not at all alike given to identical pieces.

Unfortunately the perfect specimens that may be classed as ornamental, are very rare; the material of which they are made is nearly always quite brittle, and the specimens are worked down to the last degree of thinness. Consequently, even if they may have been complete when lost or deposited with a body, the fragile substance of which they are made almost certainly ensures their breakage by the pick of the digger; the hoofs of stock; or the implement of the farmer. It is very seldom that a good specimen is to be found on the surface, and they are not much more common in the graves. Broken, imperfect, or unfinished pieces, however, are very abundant, and for the purposes of the student are as valuable as the more perfect ones—often times more so, for there is less difficulty and expense in getting them.

Without illustrations, it would be impossible to present here a clear idea of the different types that we wish to refer to; but any name given to a particular sort of specimen will be that in most common use by popular authors, so that those who have some acquaintance with the subject will readily understand what is meant in our descriptions or statements.

I will give a few particulars in regard to some of the more common forms.

**TUBES**—These are usually of slate, though many are found of sandstone, and, very rarely, one made of quartz, or similar hard stone. The preference seems to have been for a material that was susceptible of a high polish. As a rule they are cylindrical, though some have one side flattened or even grooved. They vary from an inch to six inches in length; the majority, however,

being less than four inches. The drilling was affected by means of a stick or cane, with sand. Unfinished specimens occur with a small core, showing the use of a cane or reed as a borer; in others the hole terminates in a depression that proves the use of a solid stick. It is often stated that water was supplied with the sand, but this is a mistake, as by the action of the water the stick would soon become soft and wear rapidly, thus clogging the cavity and retarding the work. The drill may have been revolved between the hands or the bow may have been employed. Of course, two persons would be required to drill the longer or thinner specimens—one to work the drill, the other to steady the stone and direct the point of the instrument.

The banded Huronian slate was a favorite stone for this, as for other forms of ornamental appendages. It is soft enough to be easily worked, takes a good polish, and some of the pieces are really beautiful in their variegated markings.

Tubes were used among the Plain Indians (according to Catlin and Schoolcraft) by the Medicine Men for sucking evil spirits and disease from the bodies of the sick. Catlin goes into considerable detail regarding such practices of the Mandan doctors. Suppose a person ran a thorn into his foot and the sore had festered and become so inflamed that the subject was confined to his tepee. The doctor, having previously provided himself with a grub worm, a cricket, or some other insect or worm, would visit the patient and carry out, in the presence of the family, numerous incantations and ceremonies. As a last resort he applied the stone tube (which he drew from his medicine pouch at the proper moment) to the wound, and after much gesticulation, he would spit out the grub or cricket which he had previously concealed in his mouth. Of course the family supposed that the worm was the evil spirit causing the disease. Since the tubes found generally throughout the Mississippi Valley are of the same form as those used among

the Plain Tribes of historic times, it is not improbable that they were put to similar purposes. Many of them no doubt served as pipes, a stem being made of a small reed, hollow stick, or bone from the wing or leg of a bird. Others show at their ends the marks of a cord by which they had been suspended, presumably from the neck of the owner. They have been called whistles, but such use is improbable, for any boy can emit a much louder and shriller whistle through his fingers than be coaxed from one of these tubes. They have also been called "telescopes," a rather large name for a small object, although on a bright day they would be of some service in looking at anything at a distance, by shutting off much of the light, and thus allowing the pupil of the eye to enlarge and take in more fully the details of the object under inspection.

PENDANTS—This term may be applied to almost any of the articles under discussion, but I propose to limit it here to the small, flat, rectangular specimens usually made of slate, and having a single perforation near one end. When found with skeletons they are almost invariably upon the breast, and the marks of wear about the perforation show that they were hung around the neck.

TABLETS OR "GORGETS"—These are flat, generally four-sided, but not often rectangular, being sometimes wider at or near one end, or having the sides curved either inwardly or the reverse. Often they are rudely decorated with incised lines, and various persons have almost worried themselves into insanity by trying to read the meaning of these scratches, which they persist in calling hieroglyphics. Possibly they had some meaning that we can not now know, as in the case of so much of the "picture writing" of the Indians; but any effort to make out a system of "written language" from such markings, is only a waste of time. Scores of fraudulent pieces are in existence, which the deluded owners cherish as their most choice possessions,

and any attempt to undeceive them is often resented as being almost in the nature of a personal insult. So long as they are happy it is perhaps as well to let them rest; but in justice to their reputation for common sense, it is to be hoped that none of our readers will allow themselves to believe in the authenticity of anything of the sort that is different from the well-known system of sign writing that is in vogue among nearly all primitive people.

The specimens of this sort that I have found in mounds have nearly all been in such position as to lead me to the belief that they were worn on the fore-arm; and it is possible there is a basis of truth in the statement that they were used to protect the wrist from the impact of the bow-string when shooting.

CEREMONIALS—The most singular of all ornamental or ceremonial objects is the "butterfly" or "banner" stone. The word "banner" means very little; "butterfly" is much more appropriate to their form. There are but very few whole "butterfly" ceremonials throughout the United States. Nearly all of them are broken. No one of the best informed Archæologists can tell you positively regarding their use. I once heard an eminent Archæologist give the following explanation; and while it is largely theoretical, yet it is the most plausible of any I have heard advanced. He said that in pre-historic times each clan or tribe had a special totem or "coat-of-arms," as it were." We know that so much is true. He said that as Catlinite was a stone used among tribes in historic times in pipe making; and that as it did not date back more than one hundred years before the discovery of America, some object or some material must have occupied its place. That at the time of La Salle's discovery of the Mississippi a large Catlinite pipe was used by De Tonty as a symbol of peace, and that whenever he exhibited it in descending the Mississippi, the symbol was both understood and respected. The authority said that this "butterfly" ceremonial was possibly used

in pre-historic times as an emblem of peace, or as a mark of distinction observed by all the tribes of the Mississippi Valley. It could not be maintained, he said, that these ceremonials were used exclusively by a single tribe. Those of West Virginia, of Ohio, of Kentucky, of Illinois and of Michigan are alike, and the other village material of these localities are vastly different. The type is very wide-spread, and therefore he would attach special significance to it. This was his opinion; and the readers of the *ARCHÆOLOGIST* may accept or reject it.

**ODD FORMS**—There are pick-shaped ceremonials, short stone tubes called beads, coffin-shaped stones, plummets, and a host of other varieties whose functions cannot even be guessed. There are broad objects of slate, drilled through the center and sharpened at each edge; these have often been called "double-bitted axes," although not one of them could serve as an axe. The first strong blow would shiver it into fragments. Collectors having these objects in their cabinets would do well to label them with an interrogation point, for there is absolutely nothing positively known regarding them, and speculations are vain.

**"BIRD STONES" OR TOTEMS**—The "bird" or saddle stones are thought to have been worn as ornaments on the top of the head; the long "bar amulets" to have been worn upon the fore-arm. I dismiss them quickly, simply saying that nearly all the "bird amulets" are very fine examples of Stone-age art.

The turtle-shaped stones, idols, effigies and like things mark the totems of tribes, their gods, etc. They belong more properly in another class, and will not be described here. Next month collectors will be given suggestions regarding field work and exploration.

*(To be continued.)*

"The common ground of the Archæologist and Geologist lies about where the series of stages in the development of man overlaps upon the series of episodes in the development of the earth."

PROF. W. J. MCGEE.

Mr. P. Wickersham, of Bellefountaine, Ohio, has a very interesting collection which was found in a gravel bank nine miles east of that town. The gentleman has written the *ARCHÆOLOGIST* concerning it.

Burials in gravel banks occur all over the northern part of the Central States. Indeed there seems to be as many skeletons found in the gravel as in the mounds. Many gravel knolls are similar to mounds in form. The Indians knew that it was much more easy to excavate graves in the knolls or kames than to throw up mounds or dig graves in clay. Possibly they understood that skeletons are well preserved by being buried in gravel instead of clay. The drainage is much better, and all conditions more favorable.

Mr. Wickersham says that several granite objects similar to unfinished pipes accompanied the skeletons, and also that three or four ornaments and bear tusks were found upon the arms and hands. The editor will visit the locality this summer and report in full, later, to the readers of the *ARCHÆOLOGIST*.

"The hammer is homely at best, and is less sought for by collectors; but from an archæological standpoint the hammer tells us more of ancient times than does the celt. It appears singular that archæological authors, as a rule, have paid so little attention to this implement."

J. D. MCGUIRE.

"Many are the lessons taught by Anthropology, but the grandest of them all is the lesson of the unity of mankind, the unity of a common nature and a common destiny, if not of a common origin."

PROF. W. H. HENSHAW.

"When I compare implements found by the thousand on the hills and in the valleys around the city of Washington with those, also found by the thousand, distributed over the United States from the Atlantic to the Pacific, and find them to be sub-

stantially the same implement; when I compare those from America with the equally great number from Europe and the Eastern Hemisphere, and find them all substantially the same implements; and when, again, comparing them with the implements of the neolithic period, whether European or American, I find them to be alike except in a few insignificant details—when I review all these facts, I am forced to the conclusion that the implements I exhibit from the district of Columbia are of the same paleolithic type as those found in the graves at Trenton and elsewhere, and that they tend to prove the existence of a paleolithic period in the United States.

DR. THOMAS WILSON.

"The Apaches poisoned their arrows by rolling the stem in deer liver which an enraged rattlesnake had been made to bite. This efficacy was more imaginary than real, because I have seen dogs, pigs, birds, horses, mules and human beings wounded by such poisoned arrows, and cannot recall the slightest increased danger or even the slightest additional inflammation from wounds made by them."

CAPT. J. G. BOURKE.

## EXCHANGE DEPARTMENT.

Exchange, For Sale and Want notices will be inserted in this department at the rate of 25 cents per month for 25 words or less and 1 cent for each additional word over 25. Dealers are referred to our regular advertising rates.

Fresh water shells of Michigan for those of other stones. Over 30 varieties. Send list. Chas. Miller, Jr., 216 Jefferson St., Grand Rapids, Mich.

Send two cent stamp for copy of The Traders' paper. Bicycles, Firearms, Watches, Indian Relics, Minerals, Real Estate. Everything to sell, trade and wanted; over 1000 different articles advertised in its columns; and a large list of Premiums given to subscribers. W. A. Beaman, Publisher, Athol, Mass.

2t. May

Wanted—Volume 1 of the Archæologist, for which I will give fine Indian relics, scientific or historical books. L. V. McWhorter, Berlin, Lewis Co., W. Va.

For Sale—A few copies of Nos. 5, 6, 7, 9, 10 and 12, Volume 1, of The Archæologist. Price 10c each. A. C. Gruhlke, Waterloo, Ind.

Wanted—Writings of L. H. Morgan, A. F. Bandelier, C. C. Jones, Jr., J. Watts de Peyster and other authors. A. J. Marks, M. D., 419 Madison St., Toledo, O.

I will exchange a new camera complete with printing frame, plate 4x6, for archæological specimens, curiosities or books. Write what you have to offer. B. W. Kumler, Parker, S. D.

100 arrowheads, 1 good grooved axe, 1 pair Indian moccasins, with rawhide soles and porcupine quill ornaments, Price \$5.00 sent on approval or will exchange for pipes or slate ornaments. C. E. Tribett, Thornton, Ind.

"The Mound Builders of Ohio," a beautifully illustrated pamphlet, describing the recent discoveries in Ohio, by Warren K. Moorehead. The Hopewell collection of sheet copper, pearls, ornaments, skeletons, graves, tools and weapons. It contains the latest conclusions concerning the pre-Columbian occupation of the Ohio Valley. Price only 24c in stamps. A. C. Gruhlke, Waterloo, Ind.

300 flint arrow and spear heads; a few stone implements and a 13 inch Algerian dagger, with engraved wood scabbard, to exchange for good historical and scientific books. Prefer works on Indians and Archæology. L. V. McWhorter, Berlin, W. Va.

A copy of "Primitive Man in Ohio," "Fort Ancient," "Cassino's Directory of Scientists" and "The Mound-Builders" to exchange for a well labeled collection from one locality. W. K. Moorehead, O. S. U., Columbus, O.



## RARE OREGON ARROWS.

I am able to furnish arrowheads from Oregon or Washington. Can furnish fair, medium, or the very finest specimens of agate, chalcedony, obsidian, jasper, etc. Can furnish large or small lots to suit. Get prices from me before you buy. Will send on approval when reference of business man or postmaster is given. H. P. Hamilton, Two Rivers, Wis.

2t. May



# THE ARCHÆOLOGIST.

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No. 6

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## DEGENERATION OF THE HUMAN TEETH.

JOS. MERCKENS, COLOGNE, GERMANY.

IN order to ascertain the normal condition of the teeth of the human race, it is necessary to determine the state of the dental organs of our ancestors; next, to study the savage races of the present day, contaminated as they are by civilization. Thus, in comparison with civilized man, we should be able to judge of the change which is taking place.

In our study of the primitive man, we find a certain indication pointing to the more animal organization. The further we go back, the more nearly man approaches the animals, and we are forced to conclude that the primitive man was simply a well developed animal. In the oldest skull that we possess, the Neanderthal, we find the striking resemblance to the anthropoid apes; namely, the excessive development of the cuspids, and the lower teeth being separated for their reception. It seems as if these teeth had served as weapons as well as for masticating food. As his brain developed, man began to use sticks and stones for defense, and depending less on his teeth, they became simply organs to assist in preparation of food which he ate in the condition in which nature supplied it, requir-

ing necessarily a thorough and laborious mastication. Very gradually he began to reduce his coarse food, consisting of uncooked meat, roots, herbs and grain, by fire, and then by mechanical means which greatly lessened the labor of mastication. In the few pre-historic skulls, that have come to us, we find perfect dental organs. Of course, so long a time has elapsed that only the best specimens must have survived, and therefore, a definite conclusion is rather difficult. The skulls remaining from those times of which we have fixed historic data show that teeth have a stronger tendency to decay.

The teeth of the Egyptian mummies, which cover a period of nearly 4,000 years, all show signs of decay. Of the old Greeks and Romans we know but little, as their way of disposing of their dead was by cremation. The only skulls relating to Roman history are those found in the excavations of Pompéii and Herculaneum, and the teeth of these specimens show that they were also afflicted by caries. Records of the old Bretons and Teutons, living at the same time as the Romans, but standing on a much lower plane

of civilization; therefore living under much more natural conditions, show that caries was almost unknown to them. All these facts prove that decay is not of modern origin and no doubt degeneration of teeth accompanies the progress of civilization.

Let us now consider the conditions as they are in the present time. Dr. Miller, in his book *"The Micro-organisms of the Mouth,"* gives an interesting comparison on the percentage of caries in the different races, of which I give the most striking ones: Esquimaux, living on meat and fish only, with  $2\frac{1}{2}\%$ ; North Americans (coasters) with  $3\%$ ; South Americans, feeding mostly on meat, but some vegetables,  $27\%$ ; New Zealanders, living on human flesh, pork, fish and roots, with  $3\frac{1}{2}\%$ ; Chinese, living mostly on vegetables,  $40\%$ ; the Gauchos, a cattle-breeding tribe, inhabiting the pampas of LaPlata and subsisting on meat, are said to be free from caries, while a related tribe in Chili that subsists on bread, beans, meat, etc., showed  $19\%$ . Again, these Gauchos who live in cities, and who eat mixed food and much sugar also suffer much from decay of the teeth. According to the last United States census, only one person in 80 now has sound teeth, while a hundred years ago one person in every 25 had perfect teeth, and 200 years ago the proportion was one in every five.

All these facts show that undoubtedly, the food, its mode of preparation, and quality have more to do with dental caries than physical development and manner of life.

The food of man has under-

gone alterations in accordance with the general law of the development of all things from simplicity to complexity. Although foods have always retained their primitive nature, the difference is in the degree of preparation.

All coarseness has been removed from food, by new processes; cereals are reduced to the finest flour which clings to the teeth and there undergoes acid fermentation, while the husks which contain the phosphates essential to bone and teeth formation and also furnish the material for mechanical grinding, are entirely excluded.

As Darwin says: "It is notorious that increased use of action strengthens the organs, and that disuse weakens them. The flow of blood is greatly increased toward any part which is performing work, and sinks again, when the part is at rest; consequently, if work is frequent, the vessels increase in size and the part is better nourished." A good example of the previous statements gives us the wisdom tooth, of which Tomes says: "The great variability in its size and shape, its occasional absence and irregularity in the period of eruption, may, when compared with its large size and regular form in the lowest savage races be taken as an indication that it is slowly disappearing, and it may be absent in future generations."

This variety in the different races, Schaffhausen explains by saying that the posterior portion of the jaw being always shortened in those that are civilized, which shortening may be attributed to the civilized man habitu-

ally feeding on soft cooked food, and thus using the jaw less.

A minor force in the degeneration of the third molar is heredity. Its rapid action upon families in causing its reduction has been noticed by every one.

Weiss has noted a family in which the grandfather erupted all the wisdom teeth. the son had one absent and one reduced, while the grandson had the uppers absent and the lowers reduced. He concluded that the existence of the wisdom teeth depends more upon mind development or civilization than upon physical development or strength. The increase of the transmission of defects is going on from generation to generation and can only terminate in their absorption. With regard to the remaining teeth in man, we may safely conclude that none of them will be lost by the same process which is destroying the third molar.

To the great question, whether the coming man will be edentulous I think, we may be safe in concluding he will not.

In the first place, man must have variety of food for his development, and this necessary variety will involve more or less the office of mastication. Stomach and taste will reject any continued monotony of soft foods, in which no motion of the jaw is required. Further, the accompanying changes of the whole human organism would be so great that we would hardly recognize man.

At last, it seems reasonable to conclude, as the changes which have taken place on the dental organ from the beginning of historical research until the present day are so little as compared to the geological evolutions of our planet, that when our dental organs are absent our globe will be in a state where it will be impossible to exist.

Yet, we may very properly speak of the human teeth as being in a transitional stage—an unstable condition which renders them an easy prey to both local and constitutional abnormal influences.

## NEOLITHIC FINDS IN ANCIENT GRAVEL DEPOSITS OF THE WESTERN CONTINENT.

DR. HILBORNE T. CRESSON.

IT must be admitted by anyone who has gone over the record of palæolithic finds in America, be they tertiary or post-tertiary, that the majority of the implements discovered have been pronounced neolithic in character, and for this reason the usual inference is made that the deposits have been subjected to a quite recent disturbance else, whence came the neolith?

The bitter discussion upon Palæolithic Man in America that has taken place within the past year in various scientific journals has shown that the extreme antiquity of man has been greatly exaggerated; and it raises the question whether like exaggeration may not be applied to the majority of similar finds on the Eastern Continent.

There is a point, however,

which should not be overlooked. It suggests itself from the number of implements of neolithic type that have been discovered in our American gravels, which are presumably, quite old aqueous deposits. I repeat that the majority of these instruments discovered have been declared to be neoliths.

The question now arises, if the implements be neolithic *in type*, have we any right to assume that the deposits in which they were found have been subjected to some quite recent disturbance — would it not, at least, be better to wait until geologists are perfectly sure in regard to the age of the deposits in which such discoveries have been made; for diversity of opinion seems to exist among them? Take, for instance the California gravels.

Landslides; pits excavated by aboriginal miners; trees that have fallen, etc., account in many cases for implements of neolithic type discovered in ancient gravel deposits; but they have been discovered where there is but little chance of the tree root disturbing the soil to a sufficient depth to account for the presence of a neolith where it is not probable the landslide ever took place, and where the pit of the aboriginal miner would have to be a very deep one to account for the presence of stone implements.

It is frequently claimed that implements of palæolithic type are found upon the surface. Why should they not be? If they have been found in Europe, they may also be found in America. What occurred on the other continent, however, is not rigidly a criterion to go by in America.

Man and the animals that lived

in the ice age must have retreated before the ice front in its advance. One can hardly imagine that they all sat down upon their haunches to be frozen. It is indeed probable that many fled before it to the unglaciated areas, and when the glaciers receded they followed them back again over the till that had accumulated. Stone implements must, therefore, have been dropped on the unglaciated areas and on the till. A second advance of the ice and another retrocession would make considerable change in the position of implements dropped during the first retrocession, and so forth. Implements dropped at the second retrocession of the ice-sheet would probably be found either on the surface, or at a moderate depth; while those dropped during the first movement, it is reasonable to suppose, might be imbedded at a considerable depth. There is no reason then, why stone implements of very ancient type should not be found on the surface, as before remarked, or imbedded in the gravel.

The ice age must have required æons of time for its changes. Could not Man, whom it is reasonable to think, survived, have improved in these long ages both physically and on the character of the implements he used? So far, the blank that exists between the palæolithic and neolithic periods remains to be proven. There is reason to think that one period may have gradually merged into the other. Even if there was a break in the fauna of the period, the superior brain-power of man may readily have aided him to escape destruction, and vegetable life enabled him to exist in the



unglaciaded areas of our Western Continent. One can scarcely credit that the brain power of man in palæolithic times was not superior to that of the mammalia of the period in which he lived, especially as he made and used stone implements to overcome them, and even invented and used pottery.

If man in the palæolithic epoch made pottery, as hitherto conceded neolithic trait, what prevented him from gradually improving the condition of the weapons he used? Some of the pottery of neolithic times is quite as rude as that of palæolithic times; and some of the implements of neolithic times, also. The neoliths that have been reported from the gravel, the *Equus* beds and other localities, should not be, then, adjudged as intrusive in all cases, for the question resolves itself, in America at least, irrespective of European finds "What ability did palæol-

ithic man possess in the manufacture of stone implements?" If there was a gradual mergence of one period into the other, palæolithic into neolithic, may not some of the implements made by Palæolithic Man have been quite as well chipped as those of early Neolithic Man?—especially during the transition period suggested?—some of these implements being covered by the gravels during the geological changes which it is reasonable to suppose occurred during that period of transition.

It would be better to account in this way for implements of neolithic type found in the gravels of America, than to claim "a disturbance of deposits" at each discovery or "fraud." Time will, however, explain matters; certainly evidence is rapidly accumulating which disproves the supposed hiatus said to exist between the palæolithic and neolithic epoch.

## A STONE FORTIFICATION NEAR GLENFORD, PERRY COUNTY, OHIO.

GEORGE THOMPSON LEWIS.

THE Licking County Reservoir, in Central Ohio, is one of the most famous resorts in the entire State. It was originally a natural lake, some five or six hundred acres in extent, and was known to both the Indians of historic and to pre-historic times as a game and fish resort. Salt licks (or marshes containing saline deposits) surrounded one side of the lake, and the bison, the deer and the elk were wont to frequent these licks. The aborigines not only hunted them, but

also came themselves to procure quantities of salt.

More than eighty years ago the State of Ohio built an enormous wall of earth and stone around the swamp land adjacent to the natural lakes, and made of it a great reservoir to feed the canals passing from Toledo to Portsmouth. This reservoir varies from a half mile to two miles in width and is about six miles in length. When the embankment was built the contractors were put to no little trouble to procure stone for

the facing of those sides next to the water. The mound builders had helped them out of the difficulty, for within a short distance of the reservoir stood the largest stone mound in the State. This material was chiefly blocks of sand stone varying from five to thirty pounds in weight. Upwards of twenty thousand loads of the stones, were hauled from the mound and used to face the embankments. No archæologist seemed to have visited the mound prior to its destruction, and therefore the accurate measurements will never be known. But, judging from the base (which is now four or five feet in height and five hundred feet in diameter) the structure originally stood forty-five feet in height,—assuming that the stones were heaped at about the same angle as is dirt in the earthen mounds. However, a monument built of stone can be higher and steeper than one of earth with the same diameter. Therefore, it is extremely probable that the structure along the lakes, when completed by the mound builders, stood not less than 55 feet in altitude. Owing to the dense undergrowth (many trees eight or ten inches in diameter) covering the present base of this mound, and the attending expense in removing so large a mass of material, no exploration of it has ever been attempted. I have not the slightest hesitancy in saying that from the numerous relics found over the adjacent fields, and the excellent objects taken from the tumuli in the neighborhood, that this mound upon exploration would be found to contain a series of objects and skeletons of beauty and value, and

which would add largely to our knowledge of the pre-Columbian occupation of America.

Stone mounds and stone forts are unique. They exist in few numbers throughout the Mississippi Valley. They mark a departure from the conventional earth mounds and enclosures. The fortification which I am about to describe, is several miles from the mound. It is placed upon a high and precipitous hill from which an indistinct view of the reservoir can be obtained. The walls are nearly two miles in extent, and enclose about eight acres. The embankments vary from two to nine feet in height. The portion within the enclosure has been cultivated, and farmers have informed me that many wagon loads of stone have been hauled from that part of the embankment which interferes with cultivation. Therefore, the present height of two feet at the weakest point must not be taken as indicative of the original wall. From comparison with undisturbed sections in the woods, the wall now crossing a meadow must have been seven or eight feet high.

Save at the point described, the wall is carried around the edge of the hill and shows great strength. The stones are irregularly shaped and seemed to have been broken from the sandstone ledges which crop out at several points upon the hillside. They are not large and flat, as in the case of some of the mounds and fortifications, stone graves, etc., of the Mississippi Valley. It can hardly be said that they were laid with any regularity; but seem, on the contrary, to have

been heaped up after the manner of an earthen enclosure. The wall at the base varies from sixteen to twenty-five feet in width.

A very singular feature is observed at this place, and one which is not to be found in any other prehistoric defensive work in the Mississippi Valley. Upon one side of the hill the ledge of sandstone outcrops for a distance of 400 or 500 yards. The builders took advantage of this ledge. They ran their wall up to each end of it and utilized the space as a part of their defense. Boulders and large masses of rock have become detached from the little cliff, and having rolled down the hill from 25 or 50 to 100 feet, are well scattered out. These would form splendid outposts for "sharp shooters" or sentinels. Many of the larger masses of rock, in falling from the parent ledge, were removed not more than five or seven feet from the base. In two instances narrow openings were thus formed which lead from the outside to within the structure. Recognizing the strategic importance of these, the mound builders constructed two little walls five or six feet high and four apart, semi-circular in form,—leading from the opening back into the enclosure. As it now appears from the outside, a body of men seeing the natural opening, would charge through it, and those behind, not being able to see what was transpiring within the structure because of the high semi-circular walls, would push their comrades through the passage. The place was a veritable trap. Doubtless, in a rush or charge ten, fifteen or twenty men would

be well within the enclosure before the mistake would be discovered. The defenders could run on top of the ledge and throw rocks or shoot arrows into the mass of besiegers in the narrow, treacherous alley. In one or two places the builders utilized large boulders as a part of the defense, and ran the wall so as to include them.

The Glenford fortification has its defects as well as its strong points. Indeed, I cannot conceive how an intelligent body of pre-Columbian men (and the aborigine was certainly possessed of considerable intelligence) could fail to take the place by storm. If they assaulted the strong (precipice) side they would most certainly be repulsed with great loss. But, suppose they were to attack it from the weakest point, upon the other side of the hill, distant a third of a mile in the woods. Here the wall never was more than six or seven feet in height, and could not have been perpendicular. Two or three hundred men could charge over it, and be inside of the inclosure. However, while the structure is a puzzle to those acquainted with modern warfare, yet it may have been sufficiently strong to resist the attacks of hostile tribes in pre-Columbian times. Perhaps there were some means of defense that we know not of.

The inclosure contains more stone than any other fortification in the Mississippi Valley. The evidences of its occupation are numerous. Taken in connection with the mound near the reservoir, it would form a most fruitful field for exploration.

## THE SIOUX MESSIAH.

THE EDITOR.

(Concluded.)

“IF this does not describe the manner in which a ‘professor’ of mesmerism influences his pupils, nothing can.

“Regarding what is seen by the converts when in the spirit-land there is much speculation. I have secured interviews with three prominent chiefs touching upon this matter, and before relating what they told me I wish to call especial attention to the strong resemblance of their visions to the teachings of the Saviour in the New Testament.

“Little Wound said :

“‘When I fell in the trance a great and grand eagle came and carried me over a great hill, where there was a village such as we used to have before the whites came into this country. The tepees were all of buffalo hides, and we made use of the bow and arrow, there being nothing of white man’s manufacture in the beautiful land. Nor were any whites permitted to live there. The broad and fertile lands stretched in every direction, and were most pleasing to my eyes.

“‘I was taken into the presence of the great Messiah, and he spoke to me these words :

‘My child I am glad to see you. Do you want to see your children and relations who are dead?’

“I replied : ‘Yes, I would like to see my relations who have been dead a long time.’ The god then called my friends to come up to where I was. They appeared,

riding the finest horses I ever saw, dressed in superb and most brilliant garments, and seeming very happy. As they approached, I recognized the playmates of my childhood, and I ran forward to embrace them while the tears of joy ran down my cheeks.”

“‘We all went together to another village, where there were very large lodges of buffalo hide, and there held a long talk with the great Wakantanka. Then he had some squaws prepare us a meal of many herbs, meat, and wild fruits and ‘wasna’ (pounded beef and choke-cherries.) After we had eaten, the Great Spirit prayed for our people upon the Earth, and then we all took a smoke out of a fine pipe ornamented with the most beautiful feathers and porcupine quills. Then we left the city and looked into a great valley where there were thousands of buffalo, deer and elk feeding.

“‘After seeing the valley, we returned to the city, the Great Spirit speaking meanwhile. He told me that the earth was now *bad and worn out*; that we needed a new dwelling-place where the rascally whites could not disturb us. He further instructed me to return to my people, the Sioux, and say to them that if they would be constant in the dance and pay no attention to the whites, he would shortly come to their aid. If the high-priests would make for the dancers medicine shirts and pray over them, no harm



could come to the wearer; that the bullets of any whites that desired to stop the Messsiah Dance would fall to the ground without doing any one harm, and the person firing such shots would drop dead. He said that he had prepared a hole in the ground filled with hot water and fire for the reception of all white men and non-believers. With these parting words I was commanded to return to earth.\*

"The above story was related by Lone Wolf, as heard by him from Little Wound. It is a literal translation.

#### MUSIC OF THE DANCE.

"There are intermissions every



Come here, my mother; my younger brother is wailing and crying. Come here, my mother; here is the father, here is the father.



"To this strain are used the words:

This the father said, he brings the pipe\* for you, and you will live. This the father said, this the father said.

\* "Just after the dancers have been crying and moaning about their sins, the priests strike up the first song, in which all join, singing with deafening loudness. Some

hour in the progress of the dance, and during these pauses several pipes are passed around. Each smoker blows a cloud upward toward the supposed dwelling place of the Messiah. He inhales deep draughts of smoke of red willow-bark into his lungs, blows it out through his nose, and then passes the pipe to his neighbor.

The songs are sung without accompaniment of a drum, as is customary in the other dances. All sing in unison, and the notes, although wild and peculiar, being in a minor key, do not lack melody. The Weasel (Itonkasan) has given me the following two songs as sung by his people during the dance:

man or woman may be at this moment at the tree, with his or her arms thrown about the rushes, sobbing as if the heart would break; or another may be walking

\* The use of the pipe is ceremonial and holy.

and crying, wringing his hands, or going through some motion to indicate the deepest sorrow for his transgressions. So the singer cries aloud to his mother to be present and aid him. The appeal to the father refers, of course, to the Messiah, and its use in this connection is supposed to give emphasis to the demand for the mother's presence and hasten her coming.

"The second song requires a longer explanation. It expresses in brief the goodness of the father. Some one of the dancers has come to life from the trance, and has just related his or her experience in the other world. The Messiah, or father, has been very near to the subject, and the high-priest, enlarging upon the importance of this fact, runs about the interior of the circle handing several pipes around, exclaiming that these pipes were received direct from the Great Spirit, and that all who smoke them will live. The people are worked up to such a pitch of religious frenzy that their minds are now willing to receive any utterance as truth undisputable, so they pass around the pipes, singing the song meanwhile. The repetition of the words, 'This the father said,' gives more weight to the song."

Because of a diminution of rations the Sioux were compelled to kill their own cattle. These had been accumulated after years of labor on the part of Government employes. It required but a few

months to reduce the herds, and October, 1890, found the Sioux no further advanced than they had been ten years before. Promises made by the Congressional Commission had never been kept. Sickness and hunger largely prevailed. In sheer desperation they joyfully turned to the new Messiah. As we have seen he was a myth,—one originated in the Shoshones' (or Crow's) country.

Messiah crazes among Indians have been frequent. But none ever ended so sadly. The Government lost about sixty soldiers and spent \$2,000,000 in military operations. The settlers lost seven lives and \$40,000. The Sioux lost about 200 lives and \$50,000 worth of property. The Government gave them increased rations and considerable money. To me, when I think of the beseeching prayers, the tearful appeals and the frantic songs while the converts addressed the Messiah; when I call back to mind that dreary, barren desert of a reservation (a large portion being "bad lands") where only hardy stock can survive, and the pitiful homes upon it, the ethnologic interest of the craze is overwhelmed by feelings of pity and sadness.

I cannot conceive how our Government can interfere in the religious belief of a class or tribe of men. It would have been as just to have stopped a religious revival of our own, and the interference would have been resented by us as it was by the Sioux.



## THE ABORIGINAL TERMS FOR LONG ISLAND. ✓

WILLIAM WALLACE TOOKER.

From the *Brooklyn Daily Eagle Almanac*.

IN this chapter it is proposed to give the etymology of the various terms which have been applied to Long Island, by the Algonquian race of people who formerly hunted in its woods, planted upon its plains and fished in its waters. There are other names for the Island that were bestowed by the Indians of Iroquoian stock, who lived in the western part of the State, but as these are not generally known; or, in fact, are never mentioned by any of the Long Island historians, they will not be considered in the present paper. The true interpretation of the many Indian geographical names upon Long Island is absolutely necessary for the proper study of the early history of the various settlements. The greater number, if not all, of these names, came into being, or were bestowed by the natives after their contact with the first settlers. Their significations supply a missing link in the chain of facts, and solve many interesting problems that were hitherto very vague, unsatisfactory and puzzling.

The earliest of these terms attached to Long Island, which has come under my observation, appears on the *Carte Figurative* of 1616 (Col. Hist. N. Y., Vol. 1). On this early map the eastern part of the Island is designated as *Nahigans*. This term denotes "people of the point." This being undoubtedly an error of the cartographer, for the reason that this name was one by which the

Narragansetts were known to the early Dutch navigators, and were the *Nanhigganeuck* of Roger Williams. The name, however, would have applied just as well to those living on Montauk Point, as to those living on the points of Rhode Island. The next appears on a map of 1631 (Doc. Hist. N. Y., Vol. 1), where the Island is designated as *Matouwacs*. Hubbard, in his *History of New England*, says: "That at the time of the grant to the Earl of Sterling in 1635, it was called by the Indians *Mattanwake*." In a copy of the grant we find it given as "All that Island or Islands heretofore commonly called by the several name or names of *Matowa*, or Long Island" (Col. Hist. N. Y., Vol. 14, p. 30). In the charter of Charles II. to his brother, the Duke of York, we find it: "Commonly called by the several name or names of *Meitowacks* or Long Island" (Thompson's L. I., Vol. 1, p. 19). In the appendix *Matawacks* (ibid, Vol. 2, p. 308). In Andros' Commission as Governor of N. Y., 1674, as well as Dongan's of 1682, it is given as *Matowacks* (Col. Hist. N. Y., Vol. 3, pp. 215, 221, 328.)

The variations quoted in the many historical works relating to Long Island are *Matouwacs*, *Meitoacs*, *Meitowax*, *Mattawacks*, *Matanwack*, *Matanwack*, *Mataurwack*, *Matowcas*. Benson, in his *Memoir* read before the N. Y. Hist. Soc., Dec. 31, 1816, considers them all one and the same, and that it

designated the Montauk tribe. This is also the opinion of Schoolcraft, as per his report on the aboriginal names, etc., read before the same society in 1844. Thompson, on the other hand, in his essay read before the same in 1845, supposes all the natives of the Island were called the *Meloacs*. Furman gives it as *Matowcas*, and says that it designated a powerful Indian sachemdom, of which Brooklyn formed a part (Antiq. of L. I., p. 275). But on another page (70), gives it as *Mattenwake*, and on the authority of Heckewelder says it signified in the Delaware, an island place. Still in doubt, on another page (77) re-translates it as from the Narragansett (?) *Mattai* "good," *auke*, "land." None of these conjectural interpretations will bear critical analysis; consequently, it is unnecessary to consider them here.

The name originally seems to have been applied to the Island by the natives on the main land, and not by the Island Indians themselves, for I have been unable to find an instance where they ever used the term; although in documentary use for many years in England to designate the Island. *Melouwacs*, *Meitowax*, or *Metanwack*, it matters little which way it is differently spelled — is by synthetical resolution *Meht-anawack*, "the land of the periwinkle," or, "country of the ear-shell." Both varieties of this shell-fish (*Fulgur Canaliculata* and *Fulgur Carica*, commonly called the periwinkle) were so termed by the aborigines on account of their shape, as in the Narragansett, *Metcauhork*, "the periwinkle or the ear-shell." The

same radicle appears in the following cognate dialects: Massachusetts, *Mehtanog*, "ear;" Abnaki *Metaak*, "an ear." Otchipwe, *N'ilawag*. Cree, *N'ittawokay*, "my ear;" Unkechaug, L. I. *Catawoc*, "ear." The latter is given with the pronominal prefix of the 2d person, "thy ear," while *m'* is the indefinite impersonal prefix, not mine, *N'atawoc*, nor yours *K'atawoc*, but "an ear" *M'atawoc*. The second component, Narr *anaw*, Mass.; *anna*, "a shell," together with the locative affix, *ack*, "land" or "country" completes the analysis.

Long Island was pre-eminently the locality where this univalve could be found in the greatest abundance, being the centre of its geographical distribution. The great number of grassy flats, shoals and coves of shallow water were, and are to-day, very prolific in them. In my investigations of the evidences of Indian sojourns on Long Island, I have found on the hill-sides and shores of Shinnecock and Peconic bays, and also at Sag Harbor and Montauk, many mounds, which, on being opened, displayed large quantities of these shells, which had been cached years ago by the red men, in order that the fish might decay and leave the shells empty and free from them, to be made into beads or ornaments. Again, the columella or stock, which had been separated from the outer and useless portion of the shell, can be found scattered in plenty in every shell heap and on every village site, bearing mute testimony to the labors of the red men. Winkle point, on Eaton's Neck, in the town of Huntington, takes its name from the quanti-



ties of the shell-fish found there. Hazard, in his collection of State papers, says the Narragansett procured many shells from Long Island, out of which they manufactured their money. Roger Williams remarks of this money: "Their owne is of two sorts ; one white, which they make of the stem or stock of the Periwinkle, which they called *Meteauhock*, when all the shell is broken off ; and of this sort six of their beads (which they make with holes to string the bracelets) are current with the English for a peny." (Narr. Club Rep't of R. Williams' Key, p. 173). The second is black, inclining to blew, which is made of the shell of a fish which some English call hens, *Poquauhock*, and of this sort three make an English penny. They that live upon the sea-side, generally make of it, and as many make as will. The Indians bring downe all their sorts of Furs, which they take in the Country, both to the Indians and to the English, for this Indian Money; this money the English, French and Dutch, trade to the Indians, six hundred miles in several parts (North and South from New England) for their Furses, and whatsoever they stand in need of from them, as Corne, Venison, etc."

No Indian name relating to Long Island has attracted more attention and been more quoted by various writers than *Seawanhacky*, Montauk, perhaps, being the only exception. But the name, however, does not seem to have been a familiar term used by all the Island Indians; neither is it found in any of the English records as far as published; therefore, it could not have been a

general term used by all the natives, but was a name that sprung into being through their transactions with the Dutch. It appears occasionally in the Dutch archives relating to some of the first purchases of land from the red men, in which is now Kings, Queens, and the western part of Suffolk County. On June 16, 1636, nine Indians, who are named, including the sachem of Massapeag in the present town of Oyster Bay, and also the sachem of the community at *Keskaechquerem*, as Canarsie was then termed, by three separate deeds, conveyed three tracts of land at Flatlands, the middle one to Jacobus Van Corlear; the western to Andreas Huddie and Wolphert Gerretsen; and the eastern to Wouter Van Twiller, the Director-General of New Netherlands, on the Island by them called *Sewanhacky*, in the last deed *Sewanhacking* (Col. Hist. N. Y., Vol. 14, pp. 3, 4). On June 15, 1639, the Sachem Mechowodt of Massapeag in Oyster Bay, with his co-owners, conveyed to the Council and Director of New Netherlands, all his, the grantor's, patrimonial lands on the Island, called in the Indian tongue *Suanhacky*, reaching \* \* \* from Rechouwacky (Rockaway) to Siketeuhacky (Secatogue Neck, Islip), in width to Martin Garretsen's Bay (Oyster Bay Harbor), then to the East River and to the kil of the flats (Col. Hist. N. Y., Vol. 14, p. 15). This grant included all of Queens County, part of Suffolk and Kings. The possession of this conveyance was the claim by which the Dutch were enabled to drive those who afterwards settled Southampton from their first essay towards a

settlement at what is now Oyster Bay Harbor.

I find its variations are *Seawanhacky*, *Seawanhacking*, *Sewanhacky*, *Suanhacky*, and modernly as *Seawanhaka*. It has been popularly translated—as will be noticed in all the Island histories—as “The Island of Shells.” This does not give its true meaning, for neither word can be evolved from the name. Nor does this interpretation give any hint as to the historical and linguistic facts concealed therein. The prefix, *sewan*, or *seawan*, is the Massachusetts (Eliot) *seahwhoun*, “scattered,” “loose,” and was the term used by the Dutch for wampum, the shell-money of the aborigines. The terminal, *hacky*, is the Delaware for land, or “country.” The Dutch almost invariably used this terminal in the Indian names, where the English used simply *ack* or *ock*. Thus Long Island was known as “*the seawan country*,” because most of the article used by the Dutch was made there.

Dr. Trumbull says: “As to the meaning of the several names of shell-money, which were used indiscriminately by the English and Dutch “*peag*” was the generic name, without regard to color or quality. “*Wompompeag*,” or “*wompom*,” was the white (*wompi*) or inferior sort of “peag.” The shell-beads, white and purple, were either strung or passed from hand loose (*sewauun*) by count. The English very generally gave to all “*peag*” the name of the white, calling it *Wompom*; the Dutch call all bead money by the name of the unstrung or loose beads, “*Sewan*,” or *Zeewan*” (Hist. Mag., New Series, No. 1, p. 47.)

In the name of a tribe, living in 1608 on what is now the Nanticoke River in Maryland, called by Capt. John Smith, *Kuskaran-aock* (= *Kuska-wau-anau-ock*), we find “a country where white beads were made,” (see Amer. Anthropologist, 1893, Vol. 6, p. 406), showing that Long Island did not enjoy a monopoly of this industry.

As time hastens onwards, and the settlement of the Island is begun by the English, another name appears on the dawn of its annals; this one, to my mind, being the most interesting of them all. Around it clusters the memories of the early struggles of our ancestors in making a home for themselves in this now great country. It tells of their transactions with the aborigines in buying land, and shows how the natives were dependent on the new comers. This appellation at first belonged entirely to the eastern part of the Island, and was applied afterward as far as the jurisdiction of the confederated Sachems extended, which included all the natives living on the Island as far west as the town of Hempstead, inclusive, as per the agreement of 1645. The title of the Sachem of *Paumanack* was used by the Sachem of Shelter Island, and after his death by his brother, the Sachem of Montauk; and it appears on deeds and confirmations of sales as far west as Queens County, which shows that it was necessary to secure the signature of the Sachem of *Paumanack*, in order to make the transfer legal according to the above agreement. For fifteen years this protectorate continued until the death of Weoncombone, the son and heir

of Wyandance, then the title was extinguished. The first time the title is used can be found on the Indian deed for Gardiner's Island, dated May 3d, 1639, as follows: "Yovawan, Sachem of *Pommanocc* and Aswaw Sachem, his wife, ffor ten coates of trading cloath to us \* \* \* payd and delivered by Lion Gardiner, commander of the forte called Saybrook ffort als Pashpeshauks \* \* \* sell unto the said Lion Gardiner all that our Island called Manchonat, etc." The deed or deeds which were given to James Farrett for Shelter Island and islands adjacent, the following fall of 1639, or the spring of 1640, have disappeared from the ken of mortal eye. This is a matter of great regret, for they would have thrown much light on the aboriginal history of eastern Long Island.

The variations in spelling are *Pommanocc*, 1639; *Pamunke*, 1648; *Pammanack*, 1656; *Paumanack*, 1658. *Paumanuck*, *Paumanche*, 1659. *Pommanock*, 1665. Some historians vary this, as *Paumanhacky*. The verbal prefix *Pomman*, or *Pauman*, is from the same root as the Narragansett. (Roger Williams) *Pummenum*, "contributes." *Pummenuminteauquash*, to "contribute money;" *Paumpaumun* (an intensive) "He habitually, or by custom, offers it." *Paupamenumwe* (Mass. Eliot, Num. 8, 21), "an offering." *Paumun-og*, "If we pay thee." *Paumun-g*, "If we pay them." (Eliot's Grammar). From this comes "*Pumpom*, a tribute skin when a Deere (hunted by the Indians or wolves) is kild in the water. The skin is carried to the Sachim or Prince, within whose territory the Deere was

slaine." (Narr. Club. Reprint, R. Williams Key). Thus we have with the locative affix, *ack*, "land," "place," or "country," our name *Paumun-ack*, "land of tribute," or, "the contributing country."

That this part of Long Island was under tribute, at this period and earlier to both the Pequots, and to the Commissioners of the United Colonies of New England, is abundantly proven by all the older writers.

Lion Gardiner, in his Relation of the Pequot war, says: "Then three days after the fight [Destruction of the Pequots at Mystic, 1637] came Waiandance, next brother to the old Sachem of Long Island \* \* \* he came to know if we were angry with all Indians. I answered "No; but only with such as had killed Englishmen." \* \* \* "Then, said he, I will go to my brother, for he is the great Sachem of Long Island, and if we may have peace and trade with you, we will give you tribute as we did the Pequots" (Lion Gardiner and his Descendants, by C. C. Gardiner, p. 17.)

At a General Court at Hartford, December 1, 1642, "Mr. Whiteing and Capt. Mason are desired to take order to demand the Tributit due fro Long Island and the Indians uppon the mayne." (Pub. Rec. Conn., Vol. 1, p. 79.)

At a meeting of the Commissioners of the United Colonies of New England, at Hartford, September 6, 1644, Youghco, the Sachem of Manhanset on Long Island, presented himself to the court, desiring that, in regard he was tributary to the English, and had hitherto observed the articles of agreement made [1637, now



lost], he might receive from them a certificate whereby his relation to the English should appear, and he be preserved as much as might be from unjust grievances and vexations; therefore they gave the following certificate: "To all whom it may concern: Whereas Long Island, with the smaller islands adjacent, are granted by the King's Majesty to the Lord Sterling, and by him passed over to some of the English in these colonies; and, whereas, the Indians in the eastern parts of Long Island are become tributaries to the English, and have engaged their lands to them; and, whereas, *Youghco*,\* *Wiantance*,\*\* *Moughmaitow*,† *Weenagamin*,‡ —do profess themselves friends to the English and Dutch, etc. It is our desire that the said Sagamores and their companions may enjoy full peace, etc." (Plymouth Col. Rec., Vol. 9, p. 18.)

Winthrop says: In 1650 the Commissioners sent Capt. Mason to Long Island to require payment of a tribute due from the Indians there, and to settle in any way in which it might be punctually discharged in future. In 1656 the Montauk chief visited the commissioners at Boston, and in answer to an inquiry whether he had paid the tribute due from him, stated that he had paid it at Hartford for the space of ten years, but it was in arrears for the four last years, which they had remitted in consideration of his distressed condition by his late war in which he had been engaged with the Narragansetts." All of which most strongly corroborates our interpretation of

the name. Further facts and records could be quoted in support of the same study.

*Wamponamon*' is mentioned in Munsill's three histories of Kings' Queens and Suffolk County, as being another Indian name for Long Island. Also stating that it takes its name from Wampum, meaning "an island of shells." I do not know who is responsible for this gross error, for such it is, and it should be no longer quoted in our histories. It is not a name of Long Island, nor does it mean "an island of shells." This is the name of the extreme eastern point of Long Island, and it first occurs in the Indian Deed of July 11, 1661, for Montauk, known as the "Hither Woods Purchase," as follows: "From the utmost end of the neck eastward called *Wompenanit*, to our utmost bounds westward called Napeake." In some copies "*Wompenoonot*." In the East Hampton records varied as *Womponamon* and *Wampanamon*. It signifies "at the east," or "eastwards;" Abnaki *Wampanoag* "the east land;" Delaware *Wapanneunk*, "on the east." Mass. Psalter, *Wampanniyau*, "easterly." Primarily from *wompi*, "white," "bright," *wompan*, "dawn," "day-break," "where daylight comes from," "the east."

These are all the terms that have been bestowed upon Long Island by the Algonquian peoples so far as known; and what is an item of interest, is that the three principal, *Meitanawack*, *Seawanhacky* and *Paumanack*, as will be observed, are derived from the industry carried on by the In-

\* Sachem of Shelter Island. \*\* Sachem of Montauk.

† Sachem of Cutchogue. ‡ Sachem of Shinnecock.



dians in the manufacture of beads and other ornaments from shell; *Meitanawack* "the material" (of which they were made); *Seawanhacky* "the article itself" (finished and ready for sale). *Paumanack*, "the tax" (or tribute of wampum which they were obliged to pay). "Thus (as one writer observes), the mint of wealth at their very doors became to its possessors the source of untold misery. Constant fear kept them toiling at the mines, while the scanty proceeds of their labor only quickened the greed of their savage masters. \* \* \* In New England the limits of the trade were considerably extended by the quantities of wampum tribute which poured into the hands of the Colonial authorities. Wampum was the commodity in which tribute was universally paid, and the stern justice of our fathers imposed this with no unsparing hand upon their weak and erring neighbors" (Woodward's *Wampum*, pp. 17, 45). Cornelius Van Tienhoven, in 1650, wrote of the "land of tribute": "The most easterly corner of Long Island, being a point on the Main Ocean, inclosing within, westward, a large inland sea, adorned with divers fair havens and bays, fit for all sorts of crafts; this Point is entirely covered with trees without any flats, and is somewhat hilly and stony; very convenient for cod fishing, which is most successfully followed by the natives during the season. This Point is also well adapted to secure the trade of the Indians in Wampum (the mine of New Netherland), since in and about the above sea (Gardiner's Bay), and the islands therein situated,

lie in the cockles whereof Wampum is made, from which great profit could be realized by those who would plant a colonie or hamlet on the aforesaid Hook, for the cultivation of the land; for raising all sorts of cattle; for fishing and Wampum trade" (Doct. Hist. N. Y., Vol. 4, p. 28). And in speaking of Gardiner's Bay, he says: "Being a considerable inland sea (whose shores are inhabited by Indians), and in which are various other fair and fertile islands. The greatest part of the Wampum for which the furs are traded is manufactured there by the natives" (Col. Hist. N. Y., Vol. 1, p. 360).

I cannot close this essay without some remarks relating to the shell from which the purple or black beads—the most valuable, in fact the gold of the natives—were made. This bivalve (the round clam, *Venus Mercenaria*) is still gathered from its many coves and creeks, and is a source of income to many fishermen. Its Indian name, while not occurring, as a name for the Island itself, is found as a component in several local names throughout its area. The most prominent being the Indian name of Wading River Creek, on the bounds between the towns of Riverhead and Brookhaven. As the creek is almost invariably mentioned as a boundmark, it is of frequent occurrence in the records. The most common form being *Pauquacumsuck*, or *Pauquaconsuck*. Paucamp, an old Indian in 1660, then eighty years old, which carried his birthday previous to the first English settlement in the New World, testified in the presence of many English and Indians: "That the

bounds of Occabauk aforesaid go on a straight line from ye head of ye river (Peconic) to ye wading creeke (now Wading River Creek. See map), on ye North Beach, which is called *Pequaocheon*, because *Pequaochs* are found there." (Book of Deeds, Vol. 2, p. 273, Albany, N. Y.). *Pequa-oc*=*Poqua-hoc* (Unkechaug). *Poqua-hock* (Narragansett), abbreviated to *Quahaug*, "round clam," literally, "thick or tightly closed shell." The terminal, *-oc*, *-hoc*, or *-hocki*, "that which covers" (as a garment), *keon*, from *t ∞ skeon* (Eliot.) "to wade," *suck*, "a brook or outlet of any stream." Thus

making *Pequa-oc-keon-suck*, the "brook or outlet where we wade for thick shells." As Roger Williams remarks in his *Key*, "*Poqua-hock*, this the English call Hens, a little, thick shell-fish which the Indians wade deep and dive for, and after they have eaten the meat there (in those which are good), they breake out of the shell, about half an inch of a blacke part of it, of which they make their *Suckauhock*, or black money, which is to them pretious."

"The Indians prize not English gold,  
Nor English, Indians' shell:  
Each in his place shall passe for ought  
What ere men buy or sell."

—ROGER WILLIAMS.

## ANCIENT AMERICAN BREAD.

INDIANS BAKING ASH CAKES IN PENNSYLVANIA ONE HUNDRED AND FOURTEEN YEARS AGO. THE END OF THE STONE AGE IN THE DELAWARE VALLEY.

H. C. MERCER.

MR. S. P. Preston, of Lumberville, told me on April 1, 1894, that he remembered his grandfather, Silas Preston, telling him how the latter, when a boy living on the farm now owned by Benjamin Goss, in Buckingham township, Bucks county, Pa., had seen Delaware Indians, encamped in bark-roofed wooden huts near by, pound corn in stone mortars with stone pestles. They mixed the meal with water, and patting the dough into flattened balls with their hands, baked these cakes in the hot embers of their open fires. He did not tell his grandson whether they salted the meal, or—what was more important, if we want to try the experiment—whether the corn grains were pounded when old and well dried,

which would be a difficult operation; when green and soft, which would be easier, or after previous parching, which would be easiest of all.

Franklin (Harshberger on Maize, p. 140), speaks of Indians, probably Delawares, parching corn grains in dishes of hot sand, and afterwards grinding them to a fine powder, which kept fresh a number of years. Captain John Smith saw Indians roasting corn on the ear, green, and when thus parched crisp, bruising it in a "wooden mortar with a polt, and lapping it in rowles in the leaves of their corn, and so boyling it for a dainty."

Parching loose grains well stirred in an open iron dish does as well as either of the above

methods in my experience, and gets over the first and main difficulty of producing the meal or dough with a stone mortar and pestle. This meal, as I have made it from freshly parched grain, is the easily produced Mexican pinol, carried invariably on long desert journeys in Chihuahua and Sonora—sometimes seasoned with herbs or parched cocoa shells, and generally mixed with sweetened water as a strengthening beverage.

The taste of cakes made of parched meal, I find on experiment, differs as much from that of others made from fresh grain as it does from the flavor of bread made by Mexican Indians from metate, crushed grains previously softened in hot lime water; but, given the meal, the Lenape process of cooking the dough in the embers of an open fire is that today in use by the negroes of Southern Maryland and Virginia. In an ash cake baked in the embers before me at Egglestons', Giles County, Virginia, in February, 1894, they reproduced the mode of the Lenape cook, while with their hoe cakes, originally baked by the cornfield hands on hoe blades thrust into the wattle and clay fire places in log cabins, another Indian cake, that cooked on flat, heated stones, is imitated.

The Lenape word "pone" much used in Virginia to mean all kinds of corn bread, including the johnny cake (baked on a greasy board like a planked shad), is not needed to show that maize bread cooking—the best of it on the Atlantic seaboard is a direct inheritance from the Indian.

Virginians justly despise all corn bread made north of Mason

and Dixon's line. We use red corn instead of white, say they, which spoils the flavor; grind the meal coarse, which spoils the grain; and lastly bake the meal (sometimes at mills) to save the frequent grinding necessitated in the South (once a week in summer and once in three weeks in winter) to prevent fermenting, which destroys the vitality.

These reasons may not fully account for the abominable corn bread of the North; but it is probable that the Indians had developed valuable modes of preparing the grain of their great plant, which neither Virginian nor Northerner have understood.

To learn from Mr. Preston that even these squatting, half-civilized Lenape, in Buckingham, went over to the sea to make shell heaps once a year, is to lessen our surprise at the man-made shell deposits of the New Jersey coast, for if these conspicuous remains of shell feasts were built up not only by coast-dwelling tribes, but by an Indian population from a good range of interior country, we need not wonder that they are very large, or suppose that they are very old.

The Indians were in the habit of going in a body several days' walk, said Mr. Preston, the elder, in April or May to the clam banks of the New Jersey coast, near New Brunswick. There they encamped for several weeks to feast on clams, and when they returned, brought to the old and infirm who had remained at home, bundles of clams slung in skins on pairs of poles running from shoulder to shoulder of two men.

Even their stone-pointed arrows were sometimes used at that time

by these tolerated stragglers, who had sold the land they lived on in 1737, as when during mowing season, they shot robins and "flickers" (golden-winged woodpeckers) in black cherry trees with bows and arrows, and strung the birds on long cords. Land turtles were cooked for food, as when Mr. Preston saw a woman throw an *apron* full into an open

fire, while another poked the tortured creatures back into the coals with a pole till they were roasted. It was remembered as a good joke that during a boiling of lye and soap fat for soft soap, an Indian woman coming to the kettle in the absence of the cooks, was seen to grease her hair with the mixture.—*April 1, 1894.*

THE ARCHÆOLOGIST \* \* \*  
has within a few months become the recognized organ of its class in America. Even the imperious intellectuality of Boston, as represented by some of its most distinguished antiquarians, has given support to the attempt to cultivate one of its favorite sciences upon the Western soil. The success of a reliable periodical devoted to the progress of archæological discovery is only one of many incidents which prove that the United States ought to distance all other countries in antiquarian research. \* \* \*

There are strong indications, notwithstanding, that we have, from the very want of an ancient history, already begun to show a kind of national antiquarian curiosity; the exploration of an earthquake in the Ohio Valley, the starting of a scientifically-equipped expedition to the country of the Cliff Dwellers, or the accidental discovery of a sea-wall in the Gulf States, obtains at least as much space in the best newspapers as one of the common scandals, accidents or crimes which are supposed to be the very staff of life to an American newspaper and its readers. According to the ARCHÆOLOGIST'S

own count, \* \* \* \*  
the newspapers of the United States published several hundred articles relating to ethnological and archæological matters during February and March of this year. It may be admitted, as Mr. Moorehead complains, that there are "exaggerated notices of buried cities in the Southwest," that "newspaper men love to picture the civilization of the lost tribes of Arizona and New Mexico." \* \* \* \*  
But this is nothing that need make our brilliant antiquaries uneasy. The antiquarian interest of the public has not yet had time to produce general scholarship. Learned and able archæological workers must be aware that sensational and ignorant speculation cannot alter the facts of the real problems which they are pursuing, and will only serve, in the end, to make the true knowledge more popular. The discoveries of the press have more of a tendency to make us a nation of skillful archæologists, as the Italians are a nation of musicians and art critics, than to exterminate the archæologists whom we already possess.—*Cin.-Com. Gazette, May 12th.*



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## EDITORIAL.

FOR several years a merry war has been waged between those who do and do not believe in the existence of Paleolithic Man. At the Madison (Wis., August, '93) meeting of the American Association for the Advancement of Science, six or eight papers bearing upon the subject were read by Messrs. Wright, McGee, Holmes, Volk and Mercer. In a spirited discussion which followed, the geologists Chamberlain and Upham, and all the archæologists present, took active part. Since 1890, Mr. J. D. McGuire has been quietly working in a different manner from others, along lines of original research and experiment. His preliminary observa-

tions were set forth in the *American Anthropologist* for July, '93. This paper, Mr. H. C. Mercer (who is well known to all our readers) controverts in the *American Naturalist* for January, '94. Since Mr. Mercer presents Mr. McGuire's arguments in order, we reproduce his article in full.

"THE NON-EXISTENCE OF PALEOLITHIC CULTURE.—Mr. J. D. McGuire, in the *American Anthropologist* for July, 1893, denies the existence of a time when man chipped but could not polish stone. Assailing not the antiquity of human remains but their cultural significance, and backed by his valuable and unique experience in the carving, polishing and boring processes of the stone age, he attacks Sir John Lubbock's celebrated definition as follows:

"(1) Battering and grinding is easier than chipping, and so must have preceeded it.

"(2) Paleolithic Men made pottery, for it is found in the Paleolithic caves of Spy, in Belgium (under Mousterian), Trou Magrite, Belgium (with Mammoth and Rhinoceros), Nabrigras, France (with cave Bear), and Engis Belgium (with Rhinoceros.)

"(3) Paleolithic cave men bored and carved bone, and used pitted stone hammers at Les Eyzies, La Madeleine, Gorge D'Enfer and Laugerie Basse, and therefore, should have been able to polish stone.

"(4) The absence of Drift specimens in Neolithic graves means that Drift 'implements' in Europe are like American quarry 'Turtlebacks,' not implements at all, and so not placed by the Neolithic men who made them, with their dead.

"(5) Polished stone implements through made by Drift Men are absent from the Drift, because the Drift beds were like American quarries where the stone chipper left no village relics.

"(6) The Drift Man's pottery is not in the Drift, because even if lost there, gravel washing would destroy it.

"We follow these arguments with great interest, but think (1) that while Indian blade-making of the Quarry time was a complex difficult art, chip knife or 'Teshoa'-making at one blow, or 'Turtle-back'-making at 20 blows (if 'Turtle-back' is all we want) is easier than hand hammering and grinding. (2) The 2d argument warrants a review of the cave records, for if Paleolithic cave men did make pottery, then the French classification collapses, and the museums and handbooks of Europe, which it seems have failed to bring out the fact, are not to be trusted. (3) Why men who bored, polished and carved bone, sketched realistic animal designs, and chipped blades equal in make to Mexican sacrificial knives, did not polish stone, seems incomprehensible. But the European Museums clearly assert that no polished stone tool has been found in the caves. If true, the fact is conclusive against Mr. McGuire. The finding of pitted hammerstones in Paleolithic caves involves a tendency to carving in the indentations themselves, but some of these hammers might have been corn, and not stone-bruisers after all, just as some such (Brough Smith's *Aborigines of Victoria*, p. 385) were used by Australian native divers for clap-

ping under water to scare fish into nets, as well as to pound roots.

"As to argument (4), the most striking European Drift form, the blunt based 'Coup de Poing' is not like the Turtle-backs in the American quarries examined. By no quarry Turtle-back analysis can it be called an unfinished implement, and so, unadapted for deposit in graves.

"If Neolithic Men made Coups de Poing as Indians made Turtle-backs, we should only have to go to a Neolithic quarry to find them; but Spiennes, fairly considered, contains none.

"To argument (5) it may be said that European Drift deposits are really analogous to our Riverside workshops where Indian relics are plenty, and not to quarries; while if we do compare them to quarries, Indian relics have been found, in my knowledge, at four. Realizing this, we see no reason why polished implements should not be found in the Drift, if the Drift Men made them. The 6th argument, as to the destruction of pottery in washing gravel, seems conclusive against expecting to find it there.

"Thanks are due to Mr. McGuire for his exceedingly interesting and suggestive paper, which should suffice to induce revision of the European cave classification, in which, as it suggests, there may be serious flaws."

This criticism is good with the exception of one point; and it is a surprise to us that Mr. Mercer should make so fatal an error. Pitted hammerstones could never be used as corn-grinders or bruisers. The pestles frequently have a gentle depression in the center;

but it is formed by the corn, and is always smooth or polished. The pits in hammers or oval-shaped stones, found on village sites all over the United States, and always identical, give evidence of pecking. They are rough and irregular. Hammers and pestles can no more be classed together than can axes and arrow-heads. With the exception of this mistake the answer is very strong.

Much new information is necessary before the solution of the problem can be affected. So far the preponderance of evidence seems to be in the negative. It remains for those strong in the faith to put in a good long summer in the field in examination of tenaces, banks, pits and quarries.

THE Marquis Nadaillac of Paris has signified his consent to act as European editor of the *ARCHÆOLOGIST*. We trust that we shall receive an article in time for the July issue.

ALL readers are requested to send in accounts of remarkable specimens in their collections; to write about discoveries, mounds or earth-works. We request that all take an active interest in our correspondence department.

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### BOOK REVIEWS.

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"Human Bones of the Hemenway Collection in the United States Army and Medical Museum. National Academy of Sciences, Vol. VI, Seventh Memoir." By Dr. Washington Matthews, Dr. S. L. Wortman and Dr. John S. Billings; 286 pgs., 59 plates, 47 figures; Government Press, Washington.

It would seem, at first sight, that this Memoir is only of value to one interested

in Osteology. But, upon careful examination, the student of Archæology, even though he have but a superficial knowledge of anatomy, will ascertain many valuable facts.

The work begins with a description of the country explored. It was along the Gila River, in Arizona, and most of the exploration was conducted in the Valley of the Salado, a tributary of the Gila. Mr. Frank Hamilton Cushing was appointed by Mrs. Mary Hemenway, of Boston, in charge of the expedition. This particular investigation is but a small part of the labors of Mrs. Hemenway on behalf of the Science of Archæology. It is due to her liberal patronage that Messrs. Cushing and Fewkes have been able to extensively study the tribes of the Valley of the Colorado.

After treating of the territory explored, the character of the pottery found, the interments, irrigation, etc., Dr. Matthews and his associates outline the methods observed in the proper measurements of crania. Numerous plates and figures illustrate the types of skulls, and clearly set forth the peculiarities of the heads of the ancient people of Arizona.

Speaking of the diseases to which these people were subject, Dr. Matthews says: "A disease exists in Zuni, which Mr. Cushing, freely translating the Zuni name, called the 'warps.' It consists of a gradually increasing, symmetrical, antero-posterior curvature of the spine, which, when it reaches completion, after years of progress, brings the knees in close proximity to the chest, and renders walking impossible. The patient is obliged to go around on short crutches, and is reduced to a helpless condition, his only occupation being the knitting of stockings."

It seems that artificial occipital flattening prevailed to some extent. "Associated with this shortening of the skull, we find more or less depression or absolute flattening of the occiput. In the most marked cases, we cannot doubt that this flattening

is artificially, although not necessarily intentionally, produced."

The Inca bone was found to be more prevalent in the crania than among the Peruvians. The table given compares the crania from the region explored with those of tribes from all over the world.

Dr. Mathews says: "Perhaps a most interesting feature discovered is the prevalence of the Inca bone and its kindred and anomalies. It shows (the table) a most remarkable correspondence in the frequency of these anomalies between the Saladoan and Peruvian races. It shows also that while in respect to three of the anomalies the Peruvians are widely separated from the rest of the human race; as heretofore studied, the Saladoans are still farther removed. In short, they out-inca the Incas."

The authors made a careful study of the olecranon perforation of the humerus. It is found in sixty-three per cent. of the left humerus, and in forty-four and one-tenth of the right in the skeletons examined. By way of comparison, the collection of humeri of white soldiers (in the army and medical museum) contain three and seven-tenths per cent. of perforation in the right humeri.

Space will not permit us to treat of the flattening of tibia and other interesting physical peculiarities of the ancient Pueblos. The work is one of great value to all students.

In September we shall present the readers of *THE ARCHÆOLOGIST* with some of the illustrations and text used in the Report.

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"Catalogue of Cliff House and Cavern Relics." McLoyd and Graham's Utah Collection. Durango, Col.

A series of brief statements descriptive of the material found in the canons of the San Juan during the winter of 1893.

Our regret in reading the report of Messrs. McLoyd and Graham is that they did not enter more into detail. Their opportunities have been great, and they

should give to the public a more lengthy account.

Speaking of burials, they say:

"Usually the larger human remains were buried in a doubled-up posture, the knees drawn up against the chest, the clothing being left on the body.

"Not enough bodies are found around their houses, and under the over-hanging cliffs, to indicate that their custom was to bury in these places. No land-marks leading to the discovery of the general burial places of the Cliff Dwellers have yet been found.

"Some of the skulls in this collection were obtained from underground rooms, that have been excavated in the clay bottoms of the caves. The largest of these rooms are as much as twenty-two feet in diameter; they have been filled in with ashes and other refuse, and the stone cliff constructed over them. The crania taken from these rooms are of natural form, never having been altered by pressure."

In the catalogue mention is made of flint drills, scrapers and knives yet in original handles; also of sandals, feather work, textile fabrics, mummies, etc. The gentlemen have done intelligent work in the San Juan country.

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"A Journal of American Ethnology and Archæology, Editor, J. Walter Fewkes. Vol. I." Houghton, Mifflin & Co., Boston. \$1.50.

A well illustrated, carefully prepared report of summer ceremonial at Zuni, Pueblo; of Zuni melodies, and of ruins on or near the Zuni Reservation.

Dr. Fewkes, accompanied by an artist, spent portions of the summer of '89 and '90 at Zuni, and with the aid of a phonograph, collected many songs sung during the "Good Dance" (or Kor-kok-shi) and other ceremonies. The report contains twenty or thirty pages of songs, and is a valuable contribution to American aboriginal music.

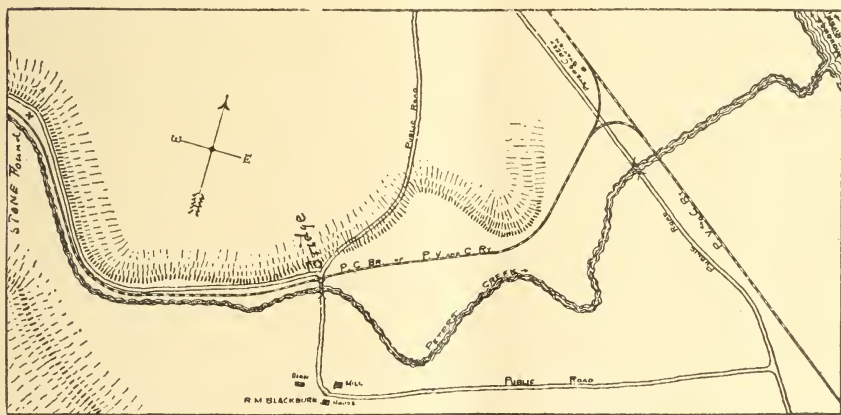


Of the chief dancer, he says: "I counted forty of these Ko-kos, including one more richly appareled than the others, who occupied a position about midway in the line of dancers. His mask was rounded above like a helmet, and was ornamented with a rude crescent, a figure of the sun, and other symbolic devices of unknown meaning. It was destitute of a horse-hair beard, his own hair being hidden in it. Around his neck, and projecting thickly outward were many long feathers, forming a ruffle or crest. His body, like that of the

other Ko-kos was naked, but instead of a turtle shell, he wore a pair of American sleigh-bells. I was told that this person was the director, and that he controlled the dance, inviting the other dancers to take part. He was the first to begin the dance and song." Dr. Fewkes says that the music has been but little affected by contact with the Americans. His description of ruins near Zuni is valuable, and has since been enlarged upon by more extended explorations.

## COLLECTORS' DEPARTMENT.

### THE PETERS' CREEK STONE.

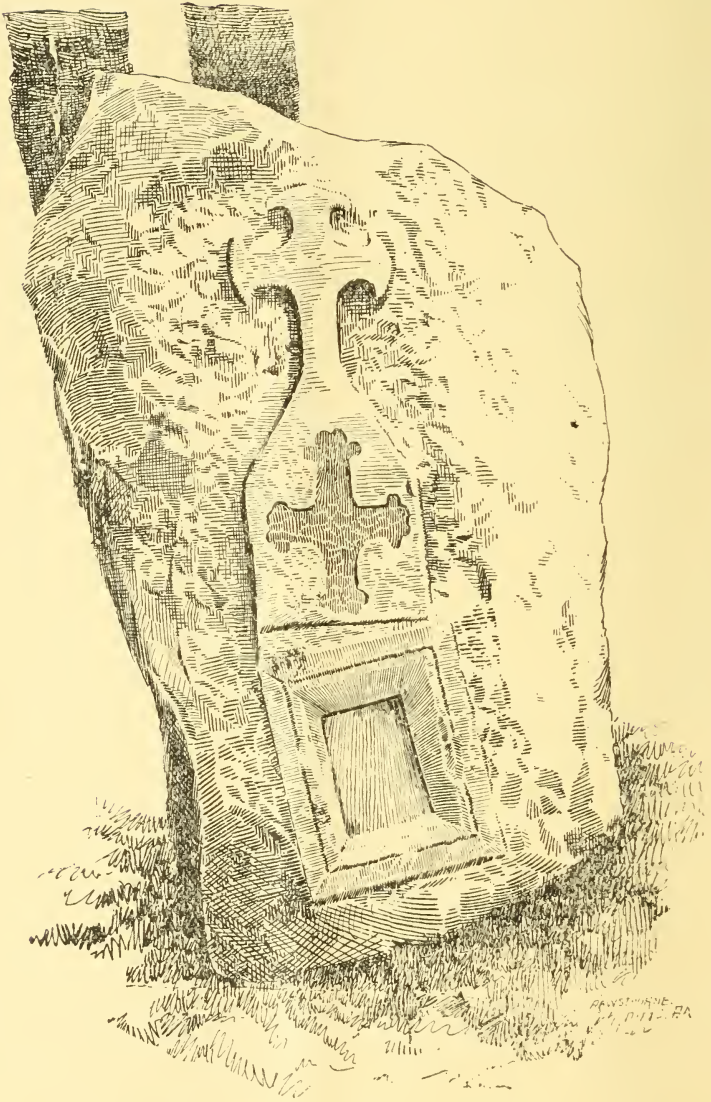


Through the kindness of Editor C. W. Hazzard, of the *Monongehela Republican*, we are enabled to present illustrations of a most remarkable historical relic recently found on Peters' Creek, nineteen miles below Pittsburg. The exact location (as given in the April 24th issue of the *Republican*) is "on a hillside, some yards from Blackburn's Bridge, in Jefferson Township, Allegheny County, as shown in the map." The railroad company, in constructing a branch line up the Creek, uncovered the

stone, and a thoughtful conductor loaded it upon a gravel train, hauled it to Monongehela, and presented it to Mr. Isaac Yohe. He will carefully preserve it.

The President of the Historical Society of Western Pennsylvania, Rev. A. A. Lambring, in commenting upon the find, says:

"I think that it contains both intrinsic and extrinsic evidences that it was the work of the early French. That people held possession of the country around the headwaters of the Ohio from the early summer



of 1754 to the fall of 1758, and roamed at will wherever they wished, being on friendly terms with all or nearly all the Indians. They were accustomed to adopt means to show that they had taken possession of territory in the name of their sovereign, as is known from Celoron's expeditions down the Allegheny and Ohio rivers in the summer of 1749, during which they buried leaden plates, with inscriptions at various points, and near them attached iron plates stamped with the arms of the king to a tree. I am convinced that this stone was one of those means of signifying that possession had been taken, and that a plate bearing an inscription was placed in the cavity cut in the stone at the foot of the crosses. Had we that plate, which is unfortunately lost, I am confident it would bear me out in the view that I maintain. The cross is a well-known religious symbol of the Catholic Church, to which the French soldiers belonged; and while I do not think it was intended to bear any religious significance here, it was still natural for them to engrave it as a means of more surely calling attention to the cavity and its contents. The location, too, of the stone is deserving of attention. I believe that an Indian trail or path extended from the Monongehela, at the mouth of Peters' Creek, across the country to the Ohio, and that it followed the Creek to the point where this stone lay, where the stream turns to the left. Here the trail took up a ravine, which extends much in the direction of the Creek to this point. This would, for that reason, be an appropriate place for setting a mark attesting the taking of possession, as it would attract the attention both of those who followed the trail and of those who ascended the stream in canoes in its higher stages. And the stone lay facing the stream and inviting attention."

Mr. Thomas Harper, of Allegheny City, is doubtless known to readers of the *ARCHÆOLOGIST* as an antiquary of ability. His remarks upon the stone are of interest.

After setting forth the facts of the discovery, Mr. Harper says:

"That the first explorers (the French 1673 and 1683) followed these Indian trails, needs no argument to prove, and history informs us their mission was to take possession of the territory, which they afterwards claimed from the Alleghenies to the Mississippi River. This was secured by burying leaden plates having described thereon the dates and signatures of the claimants. Some of these plates have been found and the location of others are known. (See Father Lambing's 'French Possession in America.') We believe therefore that all the circumstances point to the box or receptacle so artistically sunk or cut in this Peters' Creek stone to have undoubtedly contained one of those leaden plates. It will be found, upon a critical examination, that the mitring or cutting-under of the walls of this box at the bottom was to prevent the removal of the plate, and this alone is almost conclusive evidence that it was intended for the above purpose; the shape of the receptacle will also admit of the insertion of a lid or cover to protect the inserted plate. \* \* \* \* \*

"This box or receptacle 'upon my theory,' must be considered the dominant feature of the stone; the cross, in my opinion, served two purposes; first, 'we take possession of the country by the authority of his Catholic Majesty, etc., Witness our hand and seal in the receptacle underneath.' Second, the Indians were taught by the priests (who invariably accompanied all the French and Spanish explorers) to reverence the symbol of the cross, and marking as it invariably did the graves of the white man, its presence secured protection to the contents of the box."

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Prof. Robert Hay, the State Geologist of Kansas, recently found near the National Military Home in Leavenworth County, Kans., a rude stone hatchet of very ancient design. The formation in which the implement was embedded would indicate that it belonged to the paleolithic period.

## INFORMATION FOR COLLECTORS.

*(Continued.)*

There are very few collectors who have enriched their cabinets by explorations. Usually, the time spent in digging, by the average collector, results in but little good. This is not so much due to the spot selected by the investigator as to the superficial examination which he conducts. Most of the mounds and village sites are extensive, and one cannot hope to gain good results from their exploration unless that exploration is carried on on a large scale. Those collectors residing in the Southwest can obtain specimens quite easily. Many of the ruins, as well as the graves, are exposed by the strong desert winds. The soil is largely sand, the interments near the surface, and in many instances burials are actually exposed by the elements. Moreover, the ruins and the graves are much more numerous than in any other section of the United States. Collectors residing in the stone grave regions of Tennessee, Kentucky, Arkansas, or Missouri, can obtain such objects as accompany skeletons with but little labor and small expense. Other portions of the United States are not so favorable for collecting. The student of Archæology must either do an immense amount of work himself, or spend a considerable sum of money if he desires to obtain a collection illustrating in a comprehensive manner the arts, customs and daily life of the aborigines.

In no section of the United States is the despoilation of aboriginal monuments carried on to greater extent than in the Southwest. Fortunately for science, the territory is so extensive that the collectors can destroy only a small portion of the remains. Every ranchman living in the San Juan country has a collection. The same can be affirmed of many citizens of Durango, Bluff, Santa Fe, Taos, Joseph, etc. Requests made by the Smithsonian Institution, by scientific men of prominence, and by those interested in the preservation of

American antiquities are of no avail. I do not know of more than a few gentlemen of the region who are interested purely from a love of science and not account of greed of gain. It is lamentable that the Laws of the United States permit Tom, Dick and Harry to steal from Government Reservations material which properly belongs to the United States. Appropos of this, it might be said that several persons in the San Juan country had the consummate nerve to offer for sale to the United States Government specimens found upon Government land, and which were and are the property of the Nation. One cannot speak in too strong terms of the wholesale destruction of valuable scientific testimony in this region.

Throughout the Mississippi Valley the collectors have confined their cabinets largely to surface finds and to purchases from farmers. Many mounds have been opened by them. Taken as a whole, not more than twenty per cent. of the mounds of the Mississippi Valley have been explored. Of the larger mounds, those in which a small excavation has been sunk from the summit downward, can be classed as unexamined, and recent researches have conclusively shown that mounds opened in this manner are quite as rich as those which have never suffered even a superficial examination. Although, I should like to speak further of the character of the work done in the Southwest, I will refrain, and take up instead the exploration of monuments in the valley named above.

Suppose a collector desires to enlarge his cabinet, and had faithfully searched the fields for a distance of several miles from his home. He would be well acquainted with the village sites, the enclosures and the mounds of his neighborhood. His purchases of relics from farmers would give him an insight into the distribution of surface finds. Granting that he was an intelligent collector he would perceive from which locality the best specimens came. Suppose that he had forty or fifty dollars



to expend in explorations. He should select three or four mounds from three to seven feet in height and from twenty-five to forty feet in diameter at the base. If he could secure no co-operation on the part of others in his neighborhood interested in Archæology, he should hire three or four laborers, and open two or three of these mounds. The mounds should be selected upon low ground near large streams.

He should begin upon the original surface and carry a trench three-fourths the diameter of the structure through to within four feet of the opposite edge. If he does not do this the chances are extremely probable that he will not secure all the interments and relics placed in the structure by its builders. If he be of scientific turn of mind, he should lay off the mound in squares of five feet each and keep a record of the contents of each square. By such means a value will be given to his collection which otherwise it would not possess. A few stakes, and an hour's labor will suffice to lay off the average mound. A mound of the dimensions mentioned can be thoroughly explored by three laborers and the collector in three days. If he pays his men a dollar and a quarter a day, his total expenses will not amount to fifteen dollars. All collectors should do work after this manner. The Science demands it. If they ever sell collections they can obtain more money for the contents of a mound accompanied by drawings (even though they be crude) and photographs. Museums and large private cabinets are full of specimens labelled "From a mound." Such exhibits are of no value whatever. From them the students can get no reliable information.

Village sites are rather difficult of exploration. Usually the broken pottery, bones, implements, shells, etc., marking the site, are scattered through the soil to a depth of three or four feet. Often large ash heaps (or pits) exist which occasionally reach a depth of six feet. The collector can scarcely determine the period at which

such a site was occupied, and the length of occupation. The relics which he would find upon a village site would scarcely repay him for the expense necessary to make a complete examination. The character of village sites varies according to the locality in which they are found. In Tennessee, Kentucky, Ohio and Indiana the interments of the inhabitants of a village were usually made within the space occupied by the village itself. South, West and North this custom varies. While fine relics are found upon the surface in larger numbers than in the mounds or in the graves, but few of such objects as would be valued by the average collector occur two or three feet below the surface in ash-pits or among village debris. Village sites can only be explored by means of broad trenches. I know of one site, explored for the World's Fair, which cost nearly \$700. For that amount of money three acres were carefully dug over. The finds could not be sold to any dealer for \$50.00 yet they possessed the greatest scientific importance, and are of interest to all intelligent and cultured persons. Collectors would do well to let village sites alone. They cannot hope to explore one even superficially for less than one hundred or two hundred dollars, and the average collector can ill afford to expend that sum.

The large mounds, running from 20 feet high and 120 feet base to 30 by 200 feet are beyond the exploration powers of collectors; therefore, I will say nothing concerning them.

In exploring a small mound, a collector may find three or four skeletons which are fairly well preserved. He should exercise great care in taking out the crania. These are important and valuable and should be preserved if possible. Many skulls are soft, upon being first exposed, but become harder when exposed to the air and the sunshine. The newspapers persist in stating that skeletons crumble upon being exposed to the air. This opinion prevails largely, and has no foundation whatever in

fact. Skulls should be uncovered very carefully. Dig all about them until the top and sides are free of earth. Leave a strong base or neck of earth underneath to support them. Do not try to remove a skull until it has been exposed four or five hours. If it is very soft, coat it well with a thin solution of glue or shallac. If a skeleton be decayed, preserve such portions as can be removed after three or four hours. Examine all the bones to see if there are marks of disease, or healed fractures. Preserve, if possible, the lower portion (if not all) of the humerus. A perforation in the lower part of the humerus is characteristic of savage people. It is of great anatomical importance, and should be always watched for with great care. If a collector knows nothing concerning anatomy, he should call upon a physician of his neighborhood, and learn from him the points of interest in the skeletons which he exhumes. The intelligent observer should watch for the following peculiarities in prehistoric skeletons:

The flattening of the tibiae.

The presence of the Inca bone in the skull.

The prominence of the orbital arches.

The elongation of the os-calcis.

Olecranon perforation of the humerus.

Prognathism of the jaws.

Fragmentary pottery from a tumulus should always be preserved. Often a pot has been broken by earth pressure and the fragments can be restored by any one who cares to take sufficient pains.

Charcoal (which often shows marks of stone cutting tool) should be examined carefully. Calcined human bones (evidence of cremation) should also be cared for. Anything unique or unusual which the collector does not understand should be scrupulously preserved and properly labelled.

Fortifications, enclosures, circles, squares and octagons are of interest to scientists and collectors alike. The latter should keep a careful record of all such structures in his neighborhood, and ascertain whether

a village was located within them or near them. If the collectors will work in unison in the matters which have been outlined in this brief paper much heretofore unknown regarding our American predecessors will become known to science.

Next month, we will consider the various types of pipes.

*(To be continued.)*

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## RECENT DISCOVERIES.

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Up to May 10th the following discoveries have been reported:

Three skeletons and several pipes in a cave near Somerset, Pa.

Several stone graves and flint implements on the Patuxent River, near Fredericktown, Md.

At the site of two brick pyramids, near Cairo, Egypt, a profusion of gold ornaments, idols, etc. Many of them bore the cartouche of Amen-em-Hat III. The sarcophagi seem to have been built in 2366-2300 B. C. We regret that our magazine limits its field to America, and that these interesting finds cannot here be fully described.

Several more ruined cliff houses and pueblos in the Huachuca Mountains in western Arizona.

Two decayed skeletons in a mound four miles north of Columbus, Ohio. No relics with the remains.

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## MUMMIES IN THE SAN JUAN VALLEY.

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THEY WERE FOUND, WITH MANY INTERESTING RELICS, IN MOUNTAIN CAVES.

SALT LAKE CITY, April 23.—An exhibit of mummies, alleged to have been recently found in caves between the Elk and the Bule Mountains, at the head of the Comb Wash, which empties into the San Juan River, ten miles below Bluff City, Utah, was opened in a room in a hotel this week. There are six, all very well preserved; one

of a giant, one of a chief, two of women, and two of boys.

At first it was thought that they were the bodies of cliff dwellers, but as they were found under the ruins of the Cliff Dwellers' habitations, it is believed that they belonged to some race that antedated the Cliff Dwellers. Another point of difference is in the features of these mummified specimens. They have reddish hair instead of black, and have not the flatness of the head noted in the genuine Cliff Dweller.

The bodies, so it is stated by one who came out with the Hyde exploring party, were cramped into a constrained position, covered with a very curious matting or blanket of wool and feathers, then enwrapped with cedar bark. The bodies were found in various positions. With them were the remains of hundreds of wild turkeys; while by the side of one was found a well-preserved specimen of a mouse. Many curious relics were also found with these bodies. There were some black ashes in a wooden receptacle, some red corn in an earthen vessel; rude buckskin pouches, the tanning of which was different from that of the present day; a particularly fine carved onyx pipe, flint arrow heads deftly shaped, broken pottery, and many other interesting articles, the use for which is not known.

So well preserved are the specimens of some extinct race that it can easily be told that one of the boys met with a violent death; the moustache is still plainly seen upon the face of the chief, and the course of a vein can be traced in the arm of one of the women.

### Remains of the Early Jesuits and Indians in Canada.

The writer has in his collection of antiquities a lot of relics found in Canada which are especially interesting, because they represent the contemporaneous period of the Jesuit missionaries and Indians in the North about two centuries ago. About the year

1640 the Jesuits established missions among the Huron Indians, who were at that time having trouble with the Iroquois, or Six Nations. The Iroquois made an attack on the Hurons along the shores of Georgian Bay in 1648, and wiped out their villages as far as the Ottawa river. Only a small band of the Hurons escaped. In 1660, the Iroquois were as far as Montreal, having destroyed all the missions from French River on down. One of these missions was about forty miles south of French River, on the Shebeshekong.\* It was on or near the site of this mission, that the relics in my possession were found. They were unearthed by Arthur Corbman, who kindly donated them to me for my private collection. The collection consists of two copper kettles, two silver breast plates, an iron hatchet or tomahawk, a knife, a small copper ear-drop, some beads, two pieces of steel, supposed to have been used in lighting fires, and two other pieces of steel or iron, one resembling a link of a chain, and the other a hook.

The larger kettle, the capacity of which is about a gallon and a half, is seamless, being made from a solid sheet of copper. It has the handle and cover complete. The handle is made of iron. The smaller kettle holds about one quart. The original handle to this vessel was missing. Mr. Corbman unearthed another kettle, which was so corroded that it crumbled to pieces. The ones in my possession are well preserved. They are, doubtless, of European manufacture. These vessels were dug up at or near the old mission station. All that now remains of the old mission station are a few stones, which probably formed a portion of the chimney. The breast plates, tomahawk, knife, glass beads, ear-drop, knife and pieces of steel, were found in graves near the old station. The knife, tomahawk and pieces of steel are nearly consumed by rust. The knife, originally, had a handle of bone, but this has decayed. The blade

\* See Parkman's History of Canada.

is iron. The breast plates and ear-drops are well preserved. Mr. Corbman thinks these relics belonged to the Hurons. No human bones were exhumed, these having decayed. The beads are mostly cylindrical in shape, and are made from blue and red glass. The larger ones measure nearly an inch in length. I also have a perforated sea bean, which was used for a bead; several wampum beads, and a lot of small glass beads. Mr. Corbman found 17 of the sea beans and 20 wampum beads in an Indian grave on Lake Simcoe. The glass beads were found in an Indian grave on Georgian Bay. They are very small, and are made from white and blue glass.

Mr. Corbman says he has located a pit in which hundreds of Indians are buried. He will examine it at a future date. He is confident that he will find many copper and stone relics.

GEORGE J. REMSBURG.

*Atchison, Kan.*

### ✓ Archaeology of the Lower Neosho Valley.

The Neosho or Grand River drains the west side of the Ozark Hills in Kansas, Missouri, Arkansas and Indian Territory. Tributaries coming down into the river from the East are active, spring-fed streams, having great fall, and beds of flinty rocks.

Along the streams are large springs, where the ancient people found excellent places for village sites, and there is every evidence that they remained on one spot for some time, and raised corn, hunted, fished and gathered nuts. At these places, we find good and poor flint implements and other relics, both complete and in early stages of manufacture. Recently, I found a round, groove stone axe made of some granitic drift pebble. Near it I picked up a number of arrows of various patterns. Many that are found along the streams are of fine workmanship.

Many mounds are scattered throughout this valley. Some of them are so small

that at first they seem to be natural elevations, due to some unknown cause or force. But upon close inspection, I think that all the elevations artificial can be easily determined, if one exercises ordinary care. Most of the mounds along Shoal Creek are three or four feet in height, and about one hundred feet in diameter. Possibly, they were used as house sites. Along the creek are several tumuli arranged in rows, which appear to be sepulchral.

Along the foot of the Ozark hills there are numerous village sites, and from inspection of these I take it that the inhabitants lived chiefly upon the fresh water mussels and fish. They seem to have forsaken the springs of the hills and located their villages along the streams or by the swamps. On some of the habitation sites the ash pits (plentifully besprinkled with large and small unios) exist to a depth of from three to five feet. The favorite spot for habitations seems to have been at the shallows along the river, where the clams could be most easily obtained. Fish spears are found in many of the villages. The people were also fond of the frog, as is tested by numerous bones found in the ash pits.

At the greatest depths in the village sites at which implements are found, we find a rough and large type, which is quite rude. They are not unlike those which exist in considerable numbers on the hills to the east. The arrow heads on and near the surface are small and quite well made. I would therefore, draw a distinction between these two classes of implements. From the earth intervening between the two deposits I would conclude that most of the villages had been occupied at different epochs by people of varying degrees of culture. All our village sites are located upon Champ-lain deposits. In the hills the rocks outcrop as low as the Archean. I have often wondered if we could not find evidences of Paleolithic man here in Neosho Valley with more ease than anywhere else. As the glacial erosion here has exposed 3,000 feet



of rocks, I think that we have advantages over other regions to preserve archaeological evidences older than the drift. Our United States archaeologists call these objects Neolithic—are they? Village sites seem at times to have been chosen for winter occupation; and again, there are others which were inhabited in the summer only. All villages are built beyond the reach of freshets. There are abundant snails (especially the helox). We did not find a single gastropetous shell among the unios.

Most of the flint implements are made from materials occurring in the region. Mortars and pestles are usually of sand-stone and pitted stones (hemispherical excavations) are of frequent occurrence. I have in my collection a large sand-stone pipe weighing twenty ounces, and also a shale and two catlinite pipes, all from this region. The sand-stone pipe has incised lines cut for some purpose unknown by myself.

W. S. NEWTON.

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### DONDER-BEITELS.

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A few months ago I met with a curious case of the survival of the old world superstitious belief in "thunderbolts."

The person in question, by birth an American, strange to say, has given me a description of a "thunderbolt" in his possession, accompanied with a lively dissertation on the manner in which these things fall. This is the first time that I had ever met with a case of this strange old belief in regard to stone implements, to which Mr. John Evans devotes nearly the whole of an interesting chapter in his "Ancient Stone Implements and Ornaments of Great Britain." The "thunderbolt," in this instance, proved to be a stone axe picked up from the Burgoyne battle-field of Old Saratoga.

Grant Allen, in his very readable chapter entitled "Thor's Hammer," tells us that,

"The Canadian farmers give the same name to the finished weapons of the Hurons and the Objibways.' Any one interested in this subject will do well to read this fine chapter, which constitutes the last in Mr. Allen's work, "Colin Clout's Calendar."

Does it not seem strange that this notion should be found so universally spread? Mr. Evans, as before quoted, mentions eighteen countries, not to speak of Great Britain, in which it exists, while Mr. J. A. McNiell, in a paper read at the August, 1886, meeting of the American Association, says that among the modern Indians of Chiriqui, the belief obtains, that the ancient implements, of which so many fine examples have been found in that region, have "descended from the thunder clouds."

The stone hatchets are called *Piedre di raya*, or "thunder stones."\* Perhaps other readers of this journal could give us some interesting records of meeting with examples of this superstition in this country; if so, let us hear from them, stating all data obtainable, being sure not to forget to mention the nationality of the afflicted one.

PERCY M. VAN EPPS.

*Glenville, N. Y., April 24th, 1894.*

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Under the title "Information for Collectors" in the July number, will appear an article upon Pipes, by Mr. Berlin. Beginning with this number, the *ARCHÆOLOGIST* will publish the views of prominent collectors and students regarding axes, pestles, hammers, ornaments, pottery, pipes, etc., etc. The discussion will be general. No one should be deterred from participating in it on account of the belief that his information or ideas regarding certain forms of relics are of no consequence. We want all peculiar relics fully described; we desire your opinion as to the use of various ceremonial or emblematic stones. Send us communications at once, so that they may appear in the August number.

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\*Reports of the Peabody Museum, Vol. 3, p. 541.

### Proposed Field Work in Ohio for the Summer of '94.

The Department of Archæology of the Ohio State University, will carry on explorations in Hancock County in the early summer, in Licking County in July, and in Pickaway County in August and September. The funds for the work have been jointly contributed by the Ohio Academy, the State Historical Society, the University and several individuals. Some preliminary work was done in May. Village sites were looked over and several mounds visited. A mastodon skeleton was secured for the University near Catawba, in Clark County. In completeness, it ranks third or fourth in the United States. It is a very valuable addition to the University Museum. In the region where it was found are numerous gravel kames, nearly all of which contain burials. As little is known regarding gravel interments, and as they are nearly as numerous as the mounds, it is quite important that a number of them should be examined. Further, the crania and bones from the gravel are always well preserved, and afford better material for the anatomist than those from clay or loam.

The mounds of Hancock, Wood and Hardin Counties have been superficially examined. The University looks forward to its work in this section with expectation, and trusts to be able to ascertain many valuable facts concerning prehistoric man of Northern Ohio.

While Ross County has been more thoroughly worked than any other small section of the Mississippi Valley, Pickaway, its sister county on the north, has hardly been examined. Since the days of Caleb Atwater (1810-1835) little has been done, save in a desultory way, by the collectors of Circleville and neighborhood. Through the kindness of Mr. Charles Lewis, several mounds along the banks of the Scioto below Circleville will be explored.

The work in Licking County will be mainly confined to Flint Ridge.

If any discoveries of interest and value are made during the field season, the Editor will give the details to our readers.

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"The Comanches are classed with the wildest hunting tribes; the Moquis and Zunis with the most progressive and advanced—H. H. Bancroft calls them semi-civilized; yet all are classed in the general ethnic scale as 'Indians.'

"In the same sense, the mound-builders of the Mississippi Valley were 'Indians'; but in the scale of civilization, their culture must grade with that of the highest type of Indians, like the Moquis and Zunis, and other advanced tribes of the Southwest of the village or sedentary class—tribes of the same race that, under different conditions and surroundings, built up the semi-civilization of ancient Mexico and the Pueblo districts."

GATES P. THRUSTON.

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A French engineer named P. Lervyal discovered recently an immense natural cave near Guerrero, State of the same name. He explored the cave with four Indians for nearly fifteen miles underground, failing to reach the end. In one place he came across the petrified (perhaps mummified or dessicated) bodies of over four hundred Indians; also many idols and stone implements. It is understood the engineer will make further explorations.

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S. P. Wood, of Joplin, Mo., says that on the Merrimac River in that locality may be seen the remains of a circular stone wall forming an enclosure about fifty yards in diameter, and that just south of this enclosure are thirty or forty mounds built up of loose stones. These remains have never been disturbed, but Mr. Wood says that many relics have been picked up along the banks of the Merrimac.

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No. 7

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## SOME ASPECTS OF INDIAN MUSIC AND OF ITS STUDY.

ALICE C. FLETCHER.

IN presenting a few of the salient facts concerning Indian music, which have been discovered by Prof. John Comfort Fillmore and myself, with the invaluable aid of Mr. Francis LaFlesche, I shall speak only of those songs which we have obtained from native singers in their own homes. The tribes whose music has been transcribed by me, dwell between the Great Lakes and the Pacific Ocean; north of the 40th Parallel as far up as Alaska. Many of these tribes inhabit the same territory which they occupied when the light of History first revealed them to us. These Indians represent several linguistic stocks, and present various phases of tribal organization and government; they also differ in their artistic gifts and attainments, as well as in the elaboration of ceremonials pertaining to their different cults. Many of these tribes are not to be classed among the more advanced, who live in fixed habitations; but none of them can be regarded as types of primitive man. Every anthropological student recognizes that long ages of struggle lie between the dim dawn of man's advent upon the earth and the period when the

first search-light of investigation was thrown upon the Red Men of America. Their songs cannot, therefore, be regarded as primitive music, strictly speaking, since they are a product of a people who are a long way removed from the simplicity which the analogies of evolution suggest to have been characteristic of primitive man. We must bear this fact in mind as we examine these Indian songs.

It is no part of the purpose of this paper to speak of my investigations as to the birth of musical instruments. I must even forbear touching upon the evidence I have found of the *raison d'être* of their invention. I have only time to call your attention to the controlling influence which instruments have acquired; how they have come at length to master the man who made them.

So far as I have been able to learn, there is no race or people possessing a theory of music, who have not been indebted to musical instruments for the means by which their theory has been worked out. It does not seem too much to say that musical instruments have been largely responsible for the rules and practice of

the so-called schools of music among the different nations of the Eastern Continent. From all we know at the present time, it seems to be evident that before the instrument had been evolved, and man could listen objectively to his music, during the long period when the human voice was the sole means of musical expression, the mind of man was not stimulated to make observations upon the relations of one tone to another he may be said to have possessed not conscious method; to have followed no known or accepted artificial rules in the composition of his songs. He seems to have sung because of an imperative impulse to voice his aspirations, his joys and his sorrows; emotions that could in no other way find satisfactory utterance. It is because these Indian songs are entirely uninfluenced by any theory of acoustics or rules of musical composition, that they are of such great value to the student of music and the student of man. In them we discern some of the underlying natural laws which govern musical expression, and they are a revelation to us; that musical expression is a necessity to man, who would know himself and be known to his fellow-beings. His song voices emotions that lie outside the realm of words.

A learned writer, speaking upon the evolution of man, has said, that the development of the hand may be said to have ceased with the invention of implements. A similar remark might be made as to the development of real music, which has been largely arrested by the invention and multiplication of musical instru-

ments. So greatly has the scope of musical expression been enlarged and changed, since the time when the song was man's only form of melodic utterance, that the voice could now be silenced altogether, and yet nine-tenths of our music remain undisturbed. This is a startling fact, and its appreciation will help us to realize the importance which instruments have assumed, and will prepare us to understand how our ears have been trained both in enlargement and limitations by these instruments. By them, we have been taught to hear certain sounds they produce and to ignore certain others made by them, so that few of us hear at one and the same time all the noises instruments are making. I suppose, we have all such persons with intractable ears, who would persist in hearing the hammers of the piano beating upon the strings; the buzzing of the organ pipes; the scraping of the hairs of the bow upon the strings of the violin; or the buzzing of the breath in the wind instruments. To such persons the machine is more audible than the tones which the machine is producing, and the intended music can be heard only with great difficulty. I have known a few instances where this peculiarity was very marked; when instrumental music was a torture, and where songs, enjoyed when rendered by the voice alone, were blurred, distorted and unrecognized upon an instrument. That such instances are exceptional, shows how general is the subjection of the ear to the conventional training it has received in the use of instruments.



The Indian has not our ear etiquette; if I may use the word. Whatever may be his conventional training, it is not ours. I have often watched an Indian, the first time he heard one of our instruments; the violin or the piano: he would utterly fail to hear the music. The thud of the hammers on the piano wires, or the scraping of the bow across the violin strings, confused his ear and drowned the melody. I do not know how long it would take these puzzled men, if left unaided, to find out that these instruments were rendering songs with which they were perfectly familiar. In every instance under my observation, the Indian has had to be led, from the known to the unknown; has learned to hear what our instruments were doing by the addition of the voice; his ear, thus appealed to by familiar sounds, has been led to discern the similar tones of the instrument; and then, being induced himself to sing, he has been gradually left to go on alone with the instrument; when it had fully dawned upon him what the instrument was doing, his laugh of pleasure at the discovery has been as delightful as it was natural.

I call your attention to the fact that those sounds made by a musical instrument which our ears are trained to ignore, are most prominent to the Indian, when he hears the instrument for the first time; and those to which alone we listen, he must be trained to hear by means of the sounds with which he is familiar. I emphasize this fact, because it is very significant to the investigator of Indian music.

I do not know how many per-

sons here present have heard Indians sing; but, be they few or many, I am pretty sure they were inclined to consider the sounds they heard strange and most likely, unmusical. I have watched many persons of my own race trying to listen to Indian singing; trying to catch the melody. They were much like the Indian when first confronted by a strange instrument; the unfamiliar sounds caught their ear, and engrossed their attention to the exclusion of the music the Indian was rendering. The peculiarities of voice, and manner of singing, which the Indian himself ignores, which are to him no more a part of his music than the hammering and scraping of our instruments are a part of our music; these ignored sounds, being most audible to us, have received most of our attention, often preventing the hearing and appreciating of the true music of the people.

The music of the Indian is solely and simply vocal. The people know no other way of expressing emotion in melodic form. Their songs are compositions which have in them nothing borrowed from instruments; nothing of artificial instigation; and such beginnings of art as we may discern in them, cannot be accounted for as suggested by the mechanical devices which belong to a later stage in the history and development of music.

An Indian melody never serves two sets of words. There is no instance where the people have a custom like our own, of singing the different stanzas of a ballad to the same tune. In the Indian mind there seems to be so close a correspondence between the idea

the words convey and the music, that he cannot tolerate a divorce-ment and a new association. The rituals sung in various ceremonies are no exception to this rule. It is true, the musical periods are repeated over and over again in the recitation, but they are repeated only so long as the subject remains the same; as soon as the theme changes, the music changes also. For example: in the ritual which recounts the birth of the corn; its growth, when it puts out its leaves and shoots upward; the forming and ripening of its fruit; all these phases in the life of the plant are related, each one in a different musical strain.

A large proportion of Indian songs are entirely without words; syllables being used to carry the tones. These syllables, I am convinced, are not parts of archaic words, or fragments of words that have been borrowed from other tribes and their meaning lost, as has been suggested by some writers. It is true that there are songs which have fragments of words, but these are quite distinct from the syllables which are used solely for musical purposes. These characteristic syllables afford a most suggestive and interesting study, but the limits of this paper cannot include their consideration. That they exist, and are so largely used, emphasizes Indian songs as purely vocal utterances of emotion.

Perhaps, the most striking peculiarity of Indian music is the lack of definite pitch; for there is no such thing as a standard pitch among the Indians. They have no mechanical device by which to establish or to promul-

gate such a pitch. Where a standard pitch exists, and its uses enforced, social conditions are implied that do not obtain in an Indian tribe. The Indian starts his song where the natural quality of his voice and his present mood renders it easiest for him to sing it. A tenor will naturally sing upon a higher pitch than a bass; a soprano will differ from a contralto. The pitch of a song depends upon the individual, but it in no way affects the intervals of the tones; the tune is the same whether sung by a low or high-set voice. Freedom in the pitch of a song is not peculiar to Indians, but belongs in a measure to all vocal musicians; and although our ears are trained by instruments tuned to a certain standard pitch, very few persons can unaided strike a given note with accuracy. Many causes operate even among skilled singers to make them "flat" or "sharp" a tone. Emotion, physical exaltations or depression, cause variation from true pitch. The variation we all recognize as a part of the personal equation, and we would consider it strange if any one should insist that these deviations were intentional and an integral part of the music. These variations from pitch are striven against by all trained singers; but they are the rule rather than the exception in all persons who have not been carefully drilled in singing.

With the Indian there has never been anything we could call vocal training; any drill as to pitch. Some Indians like some white people, always sing flat; while some Indians, like some of us, have what we call natural

musical ears, and they sing in tones surprisingly near our own standard. Such Indians are recognized by their fellows as musical leaders; best singers, men whose services are sought and paid for on occasions of festivity. The fact that a certain correctness of intonation is recognized as good singing by the Indians, and that the possessors of such talents are often maintained by the proceeds derived from the exercise of their musical skill, is most important to be considered by the investigators of Indian music.

Did time permit, I should speak at length of the difficulties which attend the hearing and transcribing of Indian songs. Social and religious barriers are often well-nigh insurmountable, even where mutual trust and personal friendship prevails. Those who have had field experience, know that the Indian like every other human being, does not willingly submit to curious observation, and all we really know of him has been gained solely by those who have been able to enter into his thought and feeling by the common avenues of humanity.

There are difficulties also which lie in the music itself; in the matter of its rendition. One's educated ear is perplexed by the constant *portamento* of the voice of the singer; he rarely leaves one note until he has, so to speak, caught on to the next; he never takes a clear step, the result being a continuous gliding sound, confusing to those who have been taught to attack a tone with precision. But while he enjoys this blending of tones, and is disturbed by the breaking of the

voice in our singing, the Indian, for the purpose of expression, has certain devices which, to the investigator, break his tune in a confusing manner. For example: when a man has received the gift of a horse, he sings the customary songs of thanks as if he were riding the animal; his tones are jarred and jolted as by the galloping of the horse. Now, if in noting this song of thanks, one were to transcribe with phonographic exactness these jars and jolts, he would make a serious mistake, for the same song sung in acknowledgment of the gift of a robe would be entirely free from them. So, again, the *tremolo* is used in Indian music to express fervor and stress of emotion; but if one should indicate this *tremolo* by a series of short notes, he would be corrected and told to make the voice tremble, and not put in so many distinct tones.

I will not now speak of the timbre of the Indian voice, nor of its management; nor try to prove what is so self-evident, that singing out-of-doors tends to strain the voice, and so injure its tone qualities as to interfere with the cultivation of beauty and delicacy of intonation. I only mention that the Indian himself is more concerned with the response of the song to his own mood, than with its effect upon his own ear, or upon that of others; his use and enjoyment of music is emotional rather than intellectual; and the songs themselves bear little evidence of what may be called sustained musical thinking.

(To be concluded.)

## PRIMITIVE INDUSTRY.\*

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THE modern signification of primitive industry is the art work of primitive man, and as such is a test of his civilization. As we know of the earliest man only by his industries, it is justifiable under this head to consider man in the highest antiquity. The origin of man and his first known appearance upon earth have always been interesting subjects and have attracted the attention of all men throughout all time. It is mysterious, unknown; it awakens curiosity; it excites that portion of man's nature which desires to trace things to their origin, and to find a rational and satisfactory explanation of the cause and manner of man's appearing. It has been studied from various points; by Biology, by Palæontology, Linguistics, History, Psycho-physics, and by Archaeology. There are various branches of science by which the history of man can be studied, but they are all modern. The ancients knew nothing relating to the antiquity of man.

Until the times of Copernicus and Gallileo, it was believed that the earth was the center of the solar system, and that the sun, moon and stars revolved around it. Until the time of Michael Angelo, and Bernard Pallisy, fossil shells found in the earth were believed to be the fragments of

stars fallen from the heavens. One hundred and fifty or two hundred years ago the science of Geology commenced to be studied, and the formation of the earth, with its proper place in the solar system, began to be understood. At the beginning of the nineteenth century it was an accepted theory that man's appearance upon earth dated only about six thousand years ago. This theory was accepted for want of any better; those who rejected it did so *a priori*, and not because they had another or juster theory to propose. In the early part of this century, the Government of Denmark organized a commission, composed of a geologist, a zoölogist, and an archæologist, charged with the duty of investigating that country on the lines of their respective sciences, in the course of which they came upon the art works of primitive man. They pursued their investigations for nigh thirty years before the first publication was made, which resulted, after many disputes and much consultation, in the establishment of the pre-historic Ages of Stone, Bronze, and Iron. This commission found various monuments and implements, evidently of human origin and manufacture, which being unlike anything belonging to the historic man of that country, were decided to be

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\* A Saturday lecture delivered in the lecture hall of the U. S. National Museum, under the auspices of the Anthropological Society of Washington.



the evidence of an earlier and pre-historic man. The most important of these were the Dolmen, which was his tomb, and the stone hatchets. These discoveries were published in 1836 by Thomson, archæologist, and founder of the Pre-historic Museum at Copenhagen, of which he continued curator for fifty years. They were recognized throughout Western Europe, and they accounted for similar monuments and implements which theretofore had been unexplained, or if so, were attributed to supernatural means; the hatchets especially being believed to have descended from heaven in a bolt of lightning or clap of thunder, and they were called by those names respectively, "Lightning Stone" or "Thunder Stone," and were guarded as amulets for the protection of property against fire. This was the first step in the discovery of primitive industry.

In 1859, Darwin published to the world his theory on the "Origin and Evolution of Species," and thus he sought to establish and explain the antiquity of man. Contemporaneous with this was the discovery of Palæolithic implements by M. Boucher de Perthes in Northern France. The place of their original and first discovery was St. Acheul on the River Somme, but afterward they were found in other places.—Chelles, on the River Marne, near Paris, being one of the principal. The latter station gave its name to the implements, and they have since been called Chellean. So far as can now be asserted with confidence, these implements are the earliest made or used by man. They may have served as axes,

hatchets or knives, spear-heads or what-not. They appear to have been a tool for every use, just as a sailor would use his jack-knife if he had no other tool or weapon. They have been called in England "drift implements" because they were found in the river drifts or deposits. Their positions when thus found, indicated for them an antiquity equal almost to the river valleys themselves, and as belonging to that geologic period, called by the French geologists "Quarternary"; by the English, "Pleistocene"; and by American "Post-pliocene."

There was a geologic period when the waters of the earth were engaged in carving out the river valleys; eroding and cutting them out between the bluffs on either side. In that time the rivers filled the valleys from the hills, pouring down their waters with a rush and carrying the greatest quantity of water to the sea. As time progressed the waters subsided more or less, and the current became slower and less powerful. At the close of the Pliocene and at the beginning of the Quarternary period, the sand and gravel which had before been carried out to sea, began to be deposited here in this bend, and on that point until the deposit came to the surface of the water and formed what is now the highest terrace. Thus the river was narrowed, and the terrace became a new river bank. This process was repeated again and again until the river finally receded to its present bed, leaving sometimes three terraces, each one higher, deeper and more distant from the river than the other. These terraces may not exist on the rapid

mountain streams of the Atlantic slope, but they are plainly to be seen upon the longer rivers of the Western slope of the Alleghenies. They are plainly manifest in the Mississippi River and its tributaries. One who has had the opportunity for inspection of these gravelly terraces, can see at once how the material was brought down by the water and here deposited. It is dependent upon amount and velocity of water, and the size of the pebble, whether the deposit is of the finer debris or made up of pebbles only. Its layers or strata are plainly marked, and the volume and rapidity of the current can easily be surmised if not actually calculated. In France and England, bones of animals belonging to that period, animals extinct in modern times, the mammoth, even its ancestor *elephas antiquus*, the rhinoceros *merkii*, the hippopotamus, the cave bear, the saber-toothed tiger, had been caught in the whirls of water, carried down and deposited with the pebbles. In these gravels, and associated with these animals, have been found these chipped stone implements, called chellean. If these implements had been found as isolated specimens, only a few in number, they would not be nearly so convincing as when found as they have been in almost every river valley of Western Europe by the thousands, if not the tens of thousands. They are there usually of flint, probably because flint was the material easiest procured and best suited to the purpose. In localities where flint was not indigenous, quartzite had been used, and there are in

the U. S. National Museum specimens of this material from England, France and Asia. They were made altogether by chipping, that is, by being struck with the hammer; it may have been another pebble, and so flakes knocked off, first from one side and then from the other, until the implement was reduced to an irregular but sharp edge and point. They are made sometimes of a bowlder, whether of flint or of quartzite, and the crust of the original pebble is shown and part left for the grip. They are of a size to be held in the hand and used as tools or weapons. There is no evidence that they were ever hafted, but on the contrary, their form is such as to render them most difficult for satisfactory handling. An envelope of hide, grass, leaves, moss, or something similar probably served to protect the hand. They have two or three peculiarities, which it is proper to notice, other than being chipped and having a grip. They are always of appropriate size for use; they are thicker in proportion to their width than any other stone-cutting implement; they are usually almond-shaped, and their cutting-edge is at the point. The conclusion that the implements were of human manufacture, and are evidence of the antiquity of man, was not admitted until after much discussion and investigation. The first of them was found in 1836. M. Boucher de Perthes soon after published his belief that they were evidence of what he called "Antedeluvian Man." It was disputed first, that they were not of human manufacture. M. Mantel, an English geologist

of some celebrity, once read an extended paper before one of the scientific societies of London to prove they were not. The fact of their discovery was disputed, the location had to be identified and established; and it was not until 1859 (thirteen years or more), that the conclusion as aforesaid was accepted, and then only after the investigation of a joint committee of fifteen prominent scientists, half from England, half from France, which met on the ground and were fortunate enough to find some specimens *in situ*. Since then the belief in the genuineness of their evidence as high antiquity of man has been accepted by all men. It was soon after the discoveries of M. Boucher de Perthes, and those of M. Lartet, of the caves of Southern France, that Sir John Lubbock, noting the difference between this industry and that of the dolmens and polished stone hatchets of Denmark and other countries, and that they all belonged to the Stone Age, took upon himself the division of that age into Periods, of which he named the former Palæolithic, that is, the early period, and the other the Neolithic, or the later period of the Stone Age. Thus it will be perceived that the existence of a Palæolithic period, the evidence of the occupation of that country by man in a period of time earlier than the Neolithic, was as much opposed, and required as long a time to secure a favorable settlement as has the discoveries of Dr. Abbott of similar implements in the Trenton gravels. From France and England the new evidence concerning the antiquity of man spread to

other countries, and it was found that similar implements existed in nearly every country in the world. They have been found in Spain and Portugal. Mr. H. C. Mercer, a gentleman from Philadelphia, while at Madrid during the last exposition in 1892, visited one of the gravel beds of the neighborhood, San Isadore, where these implements were said to have been found, and he discovered one in place which he declares impossible to have been other than an original deposit. He secured all evidence by photographs, plaster casts, etc. So also of Italy. They have been found in various localities, and are to be seen in the museums of different cities. Prof. H. W. Haynes, of Boston, found the same kind of implement on the left bank of the Nile, not in the alluvial deposit, but in an eroded gully or water-way in the original gravelly deposits. Christian missionaries to the Holy Land have found and reported similar implements, and they are deposited in the museum at Paris. Two great stations in Hindostan were also disclosed,—one near Madras, in Southeastern Hindostan, and the other in Nerbudda, on the Northwest Coast. In many of these cases such implements were deposited deep in the gravel together with the bones of extinct animals, accompanied only by their necessary débris of chips, hammers, flakes, etc.; and except certain implements, the hammer, scraper, and leaf-shaped blade, which, from their nature, belonged to both periods, nothing was found which had any relation to the Neolithic or polished stone period. So it has come to

pass that throughout the world, whatever differences there may have been between the scientists as to the antiquity of man, or the locality of his original appearance; manner of his civilization; use of implements (and these differences have been almost infinite), nearly all of them have agreed upon the existence of this Palæolithic period, and that it was anterior to the Neolithic period. It is not, therefore, for me to continue in this country a discussion of matters which belong to other countries, and which have been fully investigated for years by the scientists of those countries, and been accepted as settled. If the evidence as to Palæolithic Man in America be developed, arguments made and investigations required, it will be nothing more than what was required in France and England at the time of the original discovery; but I am not without the belief that it will be finally acknowledged to be true in our country, as it had been in other countries. A series of pertinent questions may have already suggested themselves: What is the Palæolithic Age? What are its characteristics? By what test is it to be known? Before the name Palæolithic was given to it, indeed many times since, it was called the age of chipped stone. It must not, however, be considered that every stone implement belongs to the Stone Age because it was chipped. Our own North American Indian, during all the time he has been known, even into the present century, has made—indeed, pre-historic man has always made—his stone ar-

row and spear-heads by chipping. The term "palæolithic age," synonymous with chipped stone age, (to be translated as the early Stone age), is to be regarded as descriptive of a certain state of human culture,—a stage of human civilization belonging to the antiquity of man, and as its name indicates, one of the earliest, if not entirely the earliest civilization known. Some pre-historic anthropologists believe there have been earlier civilizations, but this conclusion is disputed, and has not been generally accepted by scientific investigators. In this early state of culture primitive man employed stone as the material for all his cutting implements. He was unacquainted with the processes of pecking or grinding, and so, to reduce these stones to a sharp edge or point, he had recourse to chipping. This he accomplished by percussion with a hammer or punch, or a pusher of some kind, or possibly all three. With these he could knock off the large chips and flakes, and could push and press off the smaller ones. In this way he reduced his implement to a cutting edge or point. The first epoch or period of man's civilization was characterized by these implements. This epoch was called by M. de Mortillet the "chellean epoch", but by M. Reinach and others, the "alluvial period," because the implements were found in the alluvial deposits of the river valleys; while others called it the age of the mammoth.

*(To be continued.)*



## PALÆOLITHIC MAN.

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THE criticism of a statement made by Dr. Brinton, in his "Notes on Anthropology", that "all must now concede that Palæolithic man made pottery," by Prof. Henry W. Haynes; which appeared in *Science*, March 23d, 1894. The criticism of the views of Prof. W. Boyd Dawkins, concerning "the comparison by fossils and human remains of the two great divisions of pre-historic time in Europe," by Mr. H. C. Mercer, of the University of Pennsylvania, which appeared in the *American Naturalist* for May, 1894; and Mr. Mercer's criticism of the writer's views questioning whether there is proof of the existence of a time, either in Europe or America, "when man chipped but could not polish stone"; which appeared in the *Naturalist* for January, 1894, has re-opened a discussion of the whole subject of a Palæolithic period and its relationship to the Neolithic period.

A well-known American archaeologist has said that "whatever differences there may have been between the scientists as to the antiquity of man, nearly all of them have agreed upon the existence of this Palæolithic period, and that it was anterior to the Neolithic period;" and the same author deprecates a "discussion in this country of matters which belong to other countries, and which have been fully investi-

gated for years by the scientists of those countries, and been accepted as settled"; and thinks it "neither requires demonstration nor admits of discussion."

So long as there are radical differences of opinion among the advocates of a particular belief, it certainly admits of and invites discussion; at least, until there be some approach to unanimity. It is undoubtedly a fact that there is a great, and in many instances a radical difference among the best known European anthropologists as to the relative status of Palæolithic and of Neolithic man.

It has been denied that there is evidence of the existence of Palæolithic man in America; and this denial has been supported by arguments which to many has amounted to conviction. On the other hand, the advocates of a Palæolithic period, have combatted this with great earnestness. It is to be regretted that the discussion has at times led to the expression of some personal feeling. The writer has expressed serious doubt whether there is any evidence of the existence of a time when man chipped but could not polish stone; and he has elsewhere given some reasons in support of his opinion. His experiments in stone-working; reproducing aboriginal and savage implements, similar to those coming to us from "the stone age", are not without significance in the

discussion of the subject.

An examination of the literature of Archæology shows the existence of very divergent views, which ever since the discoveries of Boucher de Perthes have varied greatly. It was suggested that the Stone Age should be divided into two periods, and Sir John Lubbock christened these periods "Palæolithic" and "Neolithic", which names have been generally accepted. The tendency for years was to make further subdivisions. The "Eolithic" and "Meso-lithic" have been suggested as names for periods preceeding and succeeding the Palæolithic, "as being more suitable, in the light of recent knowledge". St. Acheul, Chelles, Moustier and Madeleine have all been suggested as names for supposed divisions of the Palæolithic period. The "Drift" and the "Caves" are also claimed to represent certain differences in the age of implements, or differences in culture. Animal remains found accompanying particular implements have been declared as typical of a given period of mechanical culture. The "Kjoekkenmolddings" or "Shell heaps"; the "Dolmens"; "Lake Dwellings" and "Mounds" are all suggested as proper names by which to designate a cultural period.

The opinion of some archæologists concerning Palæolithic man appears to be that he was little removed from the apes; whereas others refer to implements possessed by him, which were recognized as "Batons-of-Command", similar to the baton of a French field marshal, as emblems of authority. Some say that during this period man only used

implements, and this may be said to be the common European and American view; on the other hand, it is accepted that these troglodytes at a certain period chipped stone with a delicacy that has since then never been excelled, if it has been equalled. One says, Palæolithic man made pottery; another says, he did not; yet, a third says, that the most that can be said, "is that during the age of the Mammoth, pottery was invented by one tribe of savage hunters living in Belgium, and that the knowledge of it never spread." The writer had supposed that the gradual advance of man from a very low stage was one of the accepted beliefs, as indicating gradual development and evolution; but a writer says, "In the Palæolithic period man has an artistic sentiment; in the Neolithic period, he apparently had none." These varying views and differences of opinion of the best known archæologists of the world, if properly quoted, would indicate that the investigations of European pre-historic anthropologists required "demonstration" of a different character from that which they have received. The idea that an American should suggest an opinion differing in any way from accepted European dicta is resented by some as heresy.

The opinion that there was a Palæolithic period in America has been heralded throughout the world, and for a time was accepted as accurate; and implements belonging to this period were asserted to have been found at Trenton, New Jersey; at Little Falls, Minnesota, and Washing-

ton, D. C. Subsequent investigations, however, appear to show that very possibly the finds of the first two localities belonged to the talus of the river banks, and were, consequently, comparatively speaking, quite modern. The Washington quarry was almost conclusively proven to be of a character not entitling it to be called Palæolithic. There are those, however, who still persist in their original assertion that all these localities produce the true Palæolith.

Dr. C. C. Abbott has strenuously contended that Trenton was the site where implements of the Palæolithic period were found, and is sustained in his belief by Professors Wright, Haynes, and others. M. Marcellin Boule and Prof. Albert Gaudry, eminent French archaeologists, have visited the Trenton locality, and M. Boule calls to mind that the controversy is almost identical with "that which occurred fifty years ago, when M. Boucher de Perthes made his now famous finds in the valley of the Somme," which are now used against Dr. Abbott. He declares the localities where Palæolithic implements are found in Europe to be very similar to Trenton in almost every respect, and attributes each to the quaternary period.

Professors W. J. McGee and W. H. Holmes, both geologists of great experience, have, after the most careful investigation, declared the Trenton finds all to belong to the "talus". Mr. Wm. Dinwiddie, Prof. Holmes' assistant, and a most careful investigator, spent six weeks in the trench running through the undisturbed gravel, which was re-

cently dug for the Trenton sewer without finding a single chipped implement. The consensus of opinion appears to be that so far as America is concerned the Palæolithic period has not been shown to have existed.

Prof. Dawkins, in the paper above referred to, "accepts the two custom-honored titles "Palæolithic" and "Neolithic"; but he calls attention to the similarity between certain chipped blades, "from the Cissbury Neolithic quarry, and the fact of their looking like Drift specimens" which "was enough to call a halt to the surface gatherer." "Prof. Dawkins showed a modern Palæolith from a North American soapstone quarry, and with it a stone tool simpler in form than the Palæolith; a 'teshoa'; together with a set of Trenton specimens, which he said should with their fellows, collected by" (naming several prominent archaeologists) "be placed, until further proof be furnished, in a suspense account."

The communication of Prof. Haynes, dissenting from the asserted pottery finds of the various caves of Europe, should not outweigh the assertions of the many authors and investigators who have unequivocally asserted that they have found pottery associated with a fauna belonging to the so-called Palæolithic period; and this is practically admitted by Reinach, as quoted by Prof. Haynes himself. These differences of opinion demonstrate to those who advocate a belief in Palæolithic Man, that a necessity exists for a revision of the subject. If M. Marcellin Boule fairly represents the foreign opinion and argument of the Palæolithic

period, the American advocates of this era will be less than before.

Pre-historic anthropologists, geologists, and anatomists have each in their turn claimed the right to settle the matter. It hardly appears possible for opinions to be more diametrically opposed to each other; yet, they are held by men whose views are entitled to the greatest consideration.

The difference between Palæolithic and Neolithic mechanical skill, so far as the writer is aware, has not heretofore had the consideration given it from a technical standpoint which it deserves. It is denied that the skill required to make the implements of the Palæolithic period was less than that required to make the Neolithic implements. This opinion has not been suddenly formed; on the contrary, it is the result of serious study from available writing on the subject, in addition to several years of actual experiment in the manipulation of savage tools and working with many different stones. Respect for accepted opinions has had a tendency to prevent an expression of views differing so widely from those of the vast majority of archæologists. Finally, however, after fully comparing references to authors with notes based on experimental work, the opinion developed has been that the mechanical intelligence requisite to polish a stone and to shape it, preparatory to polishing it, is rather less than that to chip a stone. The age of man on earth has nothing to do with the subject, so far as available data now appears to indicate.

An examination of the accepted authorities on the Stone Age in Europe appears to demonstrate almost positively that some of the earliest traces of Cave Men are often accompanied by a skill in manipulation of implements, as is evidenced by objects found far beyond anything required to make a "coup-de-poing" or a "turtle back" or the average "celt". The canine teeth of Carnivora; shells; so-called "batons-of-command" and bone needles; all delicately bored, are found in the same cave-layers which produce the bones of man and bones of an extinct fauna. The carving often observed on the teeth of bear; and on the "batons"; and on plates of ivory found in the caves with artificially chipped stone, certainly indicate more than ordinary skill with the carving tool, no matter what its shape, nor of what material it is composed. Plates of ivory with well cut figures on them required a certain skill for their production, and they are admitted to be of the Palæolithic period. In hardness, ivory is more rigid than many stones of which polished implements are made. The size of many objects of ivory found in strata accompanying the bones of a quaternary fauna prove conclusively that they were made of elephant or mammoth tusks; articles which must have been both valuable and rare to their owners. To work ivory required almost certainly that it be scraped, ground or sawed; the mere act of grinding or scraping pre-supposes a knowledge of sawing; ivory does not chip nor peck, and consequently had to be cut, sawed, or ground; the tool had



to be stone if the implement was cut, or ground, or sawed. The tool was of necessity stone or shell, or other equally hard substance. If sand was used as cutting material the pressure was that which cut the object. As soon as a blade was made a saw was in existence, for a stone tool, on hard material, would be scraped or sawed, and not cut as we know the operation of steel on wood. If the plates were sawed as suggested, it becomes difficult to doubt that the workman in sawing the plate had not acquired all the knowledge necessary to grind it. Scraping, grinding and sawing are closely related, as any one may see who will do only a few moments work with any of these tools. If these people could and did saw ivory as I have suggested, they did their work exactly as the Alaskan Indian or Japanese did theirs in the process of sawing jadeite tools; or as the Swiss Lake Dweller sawed out his celt. To acknowledge that the process of work here suggested is correct, is practically to admit the non-existence of Palæolithic Man.

In chipping stone, it does not appear possible that men could have failed for even a decade, if they were hunters, in discovering that it was only certain stones which were suitable for being chipped into tools, as it was only certain other stones which were adapted to being pecked. If an attempt is made to chip one stone and to peck another, the mechanical skill requisite to perform the work will be observed to differ materially. To chip a stone into shape, the blow must be given with deliberation, with accuracy;

and each stone must be held in a manner to influence the direction in which the chip broken off should fly. To peck a stone, the blow is given rapidly in one spot, and requires infinitely less accuracy than it does to chip the same stone.

A very general expression of opinion among European archaeologists ten years ago, was, that the chipping of American stone implements was far inferior to that of similar implements in Europe. When their attention was, however, called to the magnificent work on certain Californian implements and others from New and Old Mexico, they were forced to admit that much of the American work was equal in skill to the best European. The reason which first led them astray was that they were entirely ignorant of the methods of chipping stones, as they were of the refractory character of the stones of which most of the implements of the Atlantic Coast were made.

An examination of the rudely chipped obsidian spearheads from the Easter Islands suggests, and they have been referred to as indicative of a low stage of mechanical culture of their makers. These same islanders, however, carved rude statues representing human figures. Taking the best flaking tool which could be obtained, and a broken one of these spearheads and attempting to work it, a curious structure of the obsidian is immediately developed. You can only chip it by a blow on one side, and even then irregular flakes fly off; try to hit the stone on the opposite side, and it is immediately destroyed. Does not the flint from which the

so-called Mousterian implements are made, fracture somewhat in the same manner? The Easter Islanders, and the Cave Men alike, worked their available material as well as the fracture of the particular stone admitted of. If the implements of the other Cave periods are experimented with, it is believed that their fracture will develop the type found in the locality from whence the stone came. Man, during the Stone Age, was to a very great extent governed by his surroundings, and made the best of available material.

The writer has but a limited experience in the fracture of European flints, but in the case of the "coups-de-poings", a number of which he has examined, it appears as though the thick butt of these pebbles is due to refractoriness of the stone in developing a knot at the point supposed to be the hand-hold, thereby preventing further fracture.

Man, in his earliest steps up the ladder of progress, is said merely to have imitated one stone with another; the stones imitated being those stones now called "Palæoliths". Were imitation only essayed, great variety would inevitably ensue, because of the varying fracture of every stone; consequently, the variations in shapes would be legion. If the worker was man it is hardly possible to believe that he would not avail himself of the most suitable shapes for his purpose. Many classifications of implements have been made, and most of them are unsatisfactory; but if one will go to the genesis of the matter of classification of tools, he will find that nature

supplied her children liberally with ready-made tools as she did with a reasonable abundance of food.

Thorns for pins would suggest the scraping of ivory or of antlers.

The twigs of trees or the grasses furnished binding material; and doubting it where an increased strength was necessary, would soon lead to cord making.

An oyster or clam shell or the spall of a stone, served as a knife, as did the reed which was split.

The horns of wild cattle, shells, or gourds furnished drinking vessels.

The limb of a tree furnished the club as an offensive or defensive weapon.

The skins of wild animals furnished beds, as did the boughs of trees, or mosses.

The strength of sinew, and of intestines would suggest strong cords.

Wood, stone and sand furnished much of the material necessary to use in the economy of the household, to men of the Age of Stone. And other instances will readily suggest themselves to the student.

In these articles man had the awl, knife, scraper, wedge, club, hammer, grindstone, string, bowl and the lever. Examine the working tool of man from the earliest period up to the present, and it is remarkable to observe how little difference there is between them. The working part of the tool is practically unchanged; man's great advance has consisted in his ability of adding handles to tools, and by working them by machinery—of increasing the quantity as one man's work in a

given time. The tools which nature supplied in reasonable abundance are superior to the tools shown to us as Palæolithic implements.

Considering the method of work employed to produce the average implement of the Neolithic period; i. e., the pecked and ground tools, Prof. W. J. McGee has made a valuable suggestion when he showed that the expenditure of force is greater and more complex in chipping, than it is in pecking stone. Every implement

has, and serves its purpose, both chipped and ground. Considering the question purely from a mechanical standpoint, the whole work done in pecking and grinding a stone tool is simple; that done on the chipped tool is complex and difficult. If man, in fashioning his primitive implements performed complex work before he did simple work, it is contrary to the general order of progress. Chipping and grinding were contemporaneous.

## SUGGESTIONS THAT MAY AID IN THE INTERPRETATION OF THE MAYA HIEROGLYPHS.

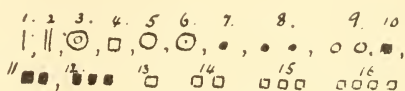
HILBORNE T. CRESSON, M. D.

### PART I.

WHEN the ancient Maya men invented a method of recording ideas, the symbols and ideographs used, it is probable, gradually acquired a certain phonetic value.

The phonetic elements and ideographs which appear in the codices, and the katuns are evidently derived from motives suggested by certain forms of animate and inanimate nature, or from things invented by man for his necessities. (See *Science*, No. 541, Vol. 22, p. 325.) They appear as single phonetic elements or may be found associated together as the minor phonetic elements of glyphs, generally enclosed inside of an ideographic outline (see figs. 26, 46, 49); or an outline bearing resemblance to the vowel elements (see figs. 26, 34, 43, 44, 45). The vowel

characters (figs. 3, 4, 5, 6, 7) will be considered further on in this



#### Positions

| Perpendicular = a  
 — Parallel = i, v, u.

/, \, Oblique = e, a.

S, (, ), Curved = an

#### Outlines.

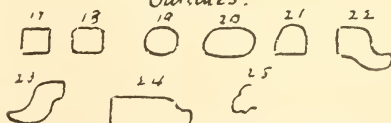


Plate I

article. The elements which appear as composite parts of the ideographs are so arranged that they assist in carrying out the design of the object it represents, and aid the reader in finding the dominant phonetic value of a glyph. The greater part of the glyphs used in the Maya graphic system, and the pictorial representations that generally accompany them are of this character, and for this reason I have used the term *ideo-phonetic* in speaking of them.

Phonetic additions are present, at times, to assist in determining the exact value intended by the scribe.

Color seems to be used with phonetic value, especially black, yellow, red, and blue. Examples may be seen in the codex *Peresianus*, plates 23 and 24, where some of the minor elements of the prefixes and suffixes to glyphs are drawn in yellow color. On plate 16, *Peresianus*, (lower third of the plate), color may be seen used as a phonetic addition to certain glyphs; excellent examples also appear on plate 15, *Peresianus*.

With the aids that I have referred to, a word may be found in the Maya vocabulary but difficulties at times occur from the incompleteness of some of these, and the fact that I have encountered certain letters which are interchangeable with each other. It is well known that x in Maya = sh, and as z = s, it can readily be understood how x can = sh or zh; ch (soft) has been found to be interchangeable with x, so we have x = sh, zh and ch. The letter b, in Maya, seems interchangeable with u, v, k and p.

I shall ask the reader to examine the word *balak*, and compare it with *ualak*, from whence it is derived. Let him also compare the word *bucab* or *vacab* with *uacab*. For the k-sound of b let him examine the leading hieroglyphs of Cortesianus 21 and Troans 35<sup>d</sup> as well as those of Codex Troans 24\*, 23\*. The b glyph in the series referred to is at times undoubtedly used as k. For the interchange of b with p, let him examine the month sign *pax*. Let him also turn to Dresden Codex 34<sup>a</sup>, and see where the *kan* glyph appears with the consonant value p. This group of figures repeats, analyzed by my system, *paxil* = "that which is to be played"; given by the center glyph on the altar. The black figure to the right of altar, the reed frame-work, and the glyph above give *paxan-ick* = "played by wind". The black color of the figure is a phonetic addition. The glyph just above the bird-head (see *pap* or *ch'el*) together with the other phonetic elements gives *paxan*; so does the small figure beating a drum (to the left of altar). The b element marked on the instrument held in the hand of the figure seated on the drum in Landas b, but below it are two phonetic additions recalling *ka* or *cha*, from whence the suggestion of the á sound is derived. The dotted l aspiate, in the head of the figure, gives xil, and *paxil* is clearly suggested. The leading hieroglyph which accompanies the figures of musicians in Codex Troano 24\*, and 23\*<sup>d</sup>, expresses *paxan*. The crossed-hatched lines is the *xan* element and the *kan* glyph in this case undoubtedly has the value of



p, giving *paxan*. I have repeatedly used this glyph with the phonetic value of *kan*, ka v-s, k, but here it is, there is little doubt, *pa* showing the interchange between k and p.

During my recent visit to Palenque, Chiapas, I was impressed by the similarity of the elements in the katunic script and in the glyph-like decorations that cover the old Maya structures, to those which appear as phonetic elements in the demotic script. There is so little variation between many of the phonetic elements referred to that I believe some of the codices to be but a demotic script, probably executed and used about the same period that the scribe sculptors carved the *katuns*. For this reason I deem the Codex Peresianus and the Codex Troano to be closely allied to the katunic script of Palenque.

"The decorative work" as it has been termed, of the ancient Mayan structures, I think, is an incorrect application of the word. It can scarcely be applied to their ideographic ornamentations which can with little difficulty be traced to a primitive symbolism, which is nature derived. In the face glyphs that are to be seen upon these structures, is to be remarked "The Long-nosed God," whose face is represented in the Codices. The face glyph of this God, can be shown to be a composite of phonetic elements, and, I think, that most of the face glyphs on the ancient Maya palaces are ideo-phonetic-compounds of ideographic suggestion and certain elements that enter in the katunic script. A good example may be had of a katunic design,

composed of phonetic elements and ideographic suggestions, when the figure on the reverse side to the glyphs of the Leyden stone is examined. (See Tablet in the Royal Netherlands Museum at Leyden.)

I feel confident that if any one interested, will take the trouble to analyze the demotic glyphs, and the ideo-phonetic designs that accompany them according to the system suggested by me in *Science* (Vol. 22, No. 567, pp. 325 to 328), he will find, as I have suggested, that the minor phonetic elements of these composites, and the phonetic additions, which at times, appear with them, will assist him greatly in obtaining a correct interpretation. I will give a brief example of how I have been aided in this respect. On Troano Plate XX\*, Division C (third division, counting from above downward), is the representation of a woman pouring water upon a child. Sixteen glyphs appear divided into blocks of four glyphs. Each block of four glyphs I have carefully worked out according to my method (referred to in *Science*); first, considering the ideographic suggestion; then finding the dominant phonetic value of each glyph by the minor phonetic elements of which it is composed; this (assisted by vowel elements and phonetic additions) gives me a clue to find in the dictionary the word suggested. It is a decided advance over the old "guess-work" system of word hunting in order to find something to suit the representation below. In the upper row of glyphs; the third from the left hand side (second group of four glyphs from the left hand

side of the *Troano* plate) is a head glyph that is placed upon the representation of a stool or seat. The ideographic representation of a stool is evident, and I readily obtained the sense intended by the scribe without using the minor phonetic elements. Still, to prove it correct, I worked out the meaning of the minor phonetic elements that appear within the outline of the stool, or connected with it, and obtained the suggestion "cha-ka-ch"; the *ka* sound being repeated by a phonetic addition inside of the outline of the stool and by phonetic additions to its right hand outer border. I have already stated that the face glyph which is represented as laid upon the stool (see remarks upon the *kan* glyph, *Science*, fig. 179, Vol. 22, page 328, No. 567) is composed of a series of phonetic elements arranged into an ideographic suggestion; all of the minor elements of this representation of a head repeat *kan* or *ka*. The leading consonantal value of this glyph is *k* and associated with the vowels it is *ka* (v-s), its syllabic value is *kan*. I used it again, in this case, with the value of *ka*, the stool suggesting *xa*, the *n* element being represented by the curved element at the top inside of the outline of the stool (the stool itself, in outline, is the *kan* curved line intimately associated with *c* and *k*) and together with the phonetic addition outside give the word *kaxan*—"water poured from above." The whole set of 16 glyphs being carefully worked out by their minor phonetic elements, and ideographic suggestion, each block of four glyphs gave, with slight varia-

tion, the following: "handfulls of water poured from above, to bathe, cleanse." In one of the blocks of glyphs the word "drops of water from above", or "water dropped from above", was used instead of "water poured from above". The elements used in all four of the ideo-phonetic compositions of the woman, which are drawn below the glyphs, repeat *kashah* or *kaxah* (*x* = *sh*, *zh*, *ch*), and *yicintah*. The meaning of the first word has been given; that of the second is "to bathe".

So far as my studies have progressed, I find that a character may represent a word, or a syllable, or a consonant of that word. For instance, there is an element that represents the word *ban* (the *n* of *Landa* is derived from it; see *Landa's Relacion*, Ed. Brasseur de B., pp. 320, 321); also *k* and *n*. Words represented by a character are, at times, read not only forward but backward. An example may be had in fig. 41 of the plate accompanying this article. It is the "twisted line", *ban*, a syllabic character with the phonetic value *ban*, *ba*; read backward it gives the value *nab*. The day sign *eznab* is an example when the twisted line *ban* appears as a minor element and is read *nab*. In the example, fig. 41, (see plate), the twisted line enters in the composition of the day sign *akbal* (as a minor element) with the phonetic value of *ba*. Another example may be had in fig. 31, "the parallel line", or "earth line" = *cab*, = at times *bac*; its leading phonetic value seems to be *ka* (v-s). That some of the elements are used with a value even so meaningless as that

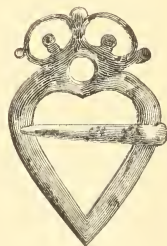
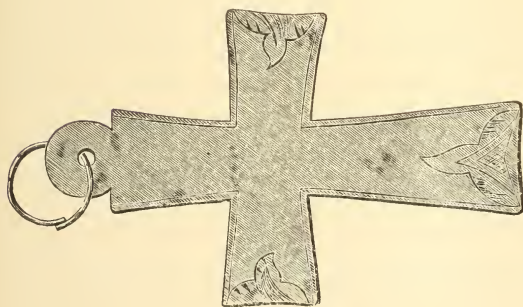
of a single letter certainly does occur.

The vowel sounds are fluctuating. I have adopted the sign (v-s) to indicate fluctuation of the vowel element. For instance, ka (v-s) indicates that ka may, at any time, appear as ka, ke, ki, ko; ak, ek, ik, ok. Phonetic additions must be sought to indicate the vowel intended, and it can then be tried, placed before or after the consonant. If the vowel element is not indicated, it must be sought for as in other primitive graphic methods.

Another example of where an element appears with a different phonetic value may be had in the wing-like appendage of the month sign *yaxkin* (see Landa's *Cosas de Yucatan*, Edit. Basseur de B., pp. 240 to 311). The wing element (*xik* = wing, in Maya) is at-

tached to the ideographic representation of the sun = *kin*. Attached to the same glyph is another glyph used as a phonetic addition, repeating the syllable, ax. It is the ideographic suggestion of a pot, or vessel, *chumac* or *xamac*, and the various phonetic elements that compare it recall cha, or xa and *mac*. The leading phonetic value of this glyph is xa (v-s) or cha, sha, zha (x = sh, ch, zh, in Maya, and are interchangeable). In this case the wing element appears with the phonetic value of ax derived from xa (v-s). The *kin* glyph repeats the syllable ki and the syllable ax is repeated again by the "pot glyph," or sun glyph, recalling ax, derived from xa (v-s). It seems like a phonetic addition to indicate the ax sound, so that no mistake be possible.

(To be concluded.)



Silver cross and buckle found in a Shawnee grave on the banks of the Ohio river near Portsmouth, in 1887.

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## EDITORIAL.

THE Field Columbian Museum has been opened with appropriate ceremonies. The arrangement of its valuable contents is now complete, and the public has entrée.

Only the department of Anthropology will interest the readers of this journal, hence we will pass over the other departments.

When the chiefs of the various departments of the Fair were appointed, Professor Putnam urged that means sufficient to carry on large and extensive explorations be given him. This the management was loath to do, as Archæology and Ethnology were, in the eyes of the directors, things of minor importance when compared with the larger and more practical departments.

Of course, no creditable exhibit (and the necessary explorations) could be made for less than one or two hundred thousand dollars. It was only by suggesting a permanent scientific institution, and thus appealing to Chicago's love of a "big thing," that the Professor secured the coveted sum. In return for his efforts on behalf of the new Museum, he received no appointment to a high position. This was somewhat of a disappointment to the Professor, so we are informed.

In some respects the museum collections from certain localities are not surpassed in extent and value in America. They have all been carefully arranged by several assistants in the beautiful Palace of Fine Arts, which will be the home of the entire Museum until a more suitable and enduring structure can be provided.

For the future of this Museum there is only the brightest outlook. With such collections as the nucleus around which to build; with an amount of money to expend in further investigation and exploration hitherto unheard of in the history of American Museums; with a body of broad-minded and liberal trustees; and finally, with a curator in whom the whole scientific world may trust with confidence, there is every reason to believe that in the near future Chicago will be the possessor of the most valuable Anthropological Museum in the New World.

There has certainly no better good fortune fallen to the Museum than the appointment of Mr. W. H. Holmes as Curator of Anthropology. Mr. Holmes enjoys the distinction of being the foremost



archæologist of America. Nor is this belief confined at home, for he stands equally high among European scientists. He brings with him the results of a long number of years of careful exploration and study. In addition, he possesses the true artistic genius which gives a fullness and completeness, and beauty to everything he does. He has, moreover, the reputation of being a careful and conscientious investigator; and from him our archæologists may expect, with a great degree of satisfaction, much that is new and conclusive among many problems which confront us on every hand.

The ARCHÆOLOGIST congratulates Chicago on its Columbian Museum; and to Mr. Holmes it extends its deepest expression of encouragement and good-will.

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ONE of the interesting signs of the times which marks the increasing interest in general anthropology, is the fact that in two of the eastern cities courses of lectures have been given which afforded a rare opportunity for those who are interested to come in contact with the most advanced thought in Anthropology. The first course is being given at the Peabody Museum of Harvard University. It began in April, and includes the following lectures:

Anthropology, and what it includes, by Prof. F. W. Putnam; Language, by Prof. C. H. Fay; Early Culture in India, by Prof. C. R. Lanman; The Beginning of Babylonian Culture, by Prof. D. G. Lyon; Pre-historic Remains at Troy, Mycenæ and Tinjús,

by Prof. W. W. Goodwin; Ancient Egypt, by Mrs. Cornelius Stevenson; Indian Song, by Miss Alice C. Fletcher; The Necropolis of Ancon, Peru, by G. A. Dorsey; American Archæology, by Prof. F. W. Putnam.

As will be seen from the above list of lectures, the object of the course at the Peabody Museum was to illustrate the various phases of Anthropology, from widely separated fields, but which are of the greatest importance in their bearing on the general subject.

The other scene of activity is at Washington, where, under the auspices of the Anthropological Society, two courses are being given. The first is confined to Somatology, or the physical structures and characteristics of man. The lecture as announced in the bulletin of the Anthropological Society, are as follows:

Relations of Man and Microbe, by Brig.-Gen. George M. Sternberg; The Mechanism of Sensation, by Dr. Frank Baker; The Evolution of the Hand, by F. A. Lucas; The Mongol and his Home, by W. Woodville Rockhill; Giants and Pygmies, by D. G. Brinton. The second course relates to Demology, or the products of human activity, and includes the following lectures:

Masterpieces of Aboriginal American Art, by Prof. W. H. Holmes; Types of Aboriginal Beliefs, by Frank Hamilton Cushing; Beginnings of Speech and Writing, by Col. Garrick Mallery; Ancient Eastern Politics, by Dr. Cyrus Adler; The Development of Higher Education, by Hon. John W. Hoyt.

## BOOK REVIEWS.

Journal of the Academy of Natural Sciences, Philadelphia. Certain Sand Mounds of the St. John's River, Florida; by Clarence B. Moore. Earthenware of Florida; by W. H. Holmes. For sale by the Academy. \$3.75.

Mr. Clarence B. Moore has spent a number of years in exploration of the tumuli of Florida. Archæologists have been looking forward with expectation, until the time when Mr. Moore's report should appear. Now that it is before us, we can post ourselves upon a region of intense interest, yet one which has been heretofore unknown. The culture of the Florida tribes reached a comparatively high plane in pottery manufacture. Some of the hoe-shaped ceremonials; the celts, etc., indicate skill in implement manufacture. But the tribes, taken as a whole, fall far short of their brothers, the other Southern tribes. Their mounds evince little skill in construction, and they must be rated below those of other portions of the Mississippi Valley.

Mr. Moore has set forth his explorations in detail. Mr. Holmes has furnished him with an admirable paper upon the ceramics of the Florida tribes; and Dr. Miller and Professor Cope have assisted him in determining the bones of animals, birds and fishes found during his excavations, and in anatomical work upon the skeletons. Taken as a whole, the volume ranks next in beauty of text and illustration to the Baron's Cliff Dwellers of the Mesa Verde. It certainly cost a large sum to publish it, and Mr. Moore is to be congratulated upon his work.

Beginning with Putnam County, he runs up the river through Volusia, Lake, Orange, Osceola and Brevard. In each of these he explored a number of mounds. We here quote some of the important statements and conclusions of Mr. Moore:

"The sand mounds of the River, while having a general resemblance, vary so in detail that an accurate classification is impossible. Many are crowded with human

remains, while in others considerable excavations along the base failed to reveal an indication of use for purposes of sepulture. Numerous mounds are variously stratified with sand of different shades, from the surrounding territory; with shell; with muck, and with sand mingled with hematite in powder. Others again are composed of one homogeneous material. Some have a sprinkling of shell; in others not a single *ampullaria* or *paludina* can be found. It is probable that certain mounds were used as lookout stations, and possible all in later times served for domiciliary purposes. In height and extent also there is a wide divergence. The great mound at Tick Island has an altitude of over 17 feet, while the famous Mount Royal, with a circumference of 555 feet, is in area approached by no mound on the river. On the other hand, small sand mounds not exceeding three feet in height are by no means uncommon. Also, without exception, the shape is a truncated cone; the summit plateau in some showing an area doubtless more extensive than the original through the effects of the elements. Even the form of burial varies. Intrusive interments are in an anatomical order as are bodies originally buried in certain mounds; while in others the long bones denuded of flesh previous to burial lie in a bundle with the crania; and again, both forms of interment are met with side by side, and evidently contemporary. Still, another form of burial is that of disconnected bones where no effort has been made to keep in association the various portions of the skeleton. The 'chief-tain' mounds cited by the late Col. Jones and others, are not met with on the river, nor bodies ever found in a sitting position.

"SAND MOUNDS IN PINE WOODS, LAKE COUNTY.

"*Crania*.—In all, thirty crania were met with, of which several were saved. At times bundles of long bones were found without the skull, while in other portions of the mound fragments of isolated crania

were encountered. At times great bunches of long bones were found with two or three crania in association. These bunches were taken out in solid mass, almost without exception thickly enveloped by roots. Roots of the scrub palmetto ran in numbers through the shafts of the long bones, partially filled the crumbling skulls, and appeared in bunches through the sockets of the eyes. Most skeletons lay near or upon the base. Exactly in the center of the mound, in actual contact, were seven crania surmounted by a mass of long bones lying at all angles and in all planes. With the long bones mandibles, pelvises and scapulæ, but the smaller bones were wanting.

"During our extended investigations in the Tick Island mound absolutely nothing indicating contact with the whites was met with, nor were objects of polished stone found other than superficially. In comparison with the mass of material handled the objects discovered were few, and when we consider the results yielded by the mounds at Dunn's Creek, at Norwalk Landing; in the pine woods near Blue Creek, and at Mt. Royal, we are lead to believe that poorer and probably earlier Indians piled up the sand at Tick Island." It must be remembered that Mr. Moore and his co-laborers found a few gold and silver objects, many chert implements and polishers, celts and hoe-shaped ceremonials, at other mound sites. He also found in some of the tumuli evidences of white influence. Glass beads, iron knives and hatchets were fairly numerous.

His collection contains many effigies of animals and fish in clay. All of these are small, and seem to have been toys. They are rudely made, and cannot compare with the effigies found in Arkansas and Missouri mounds. He gives fifteen or twenty plates of them.

In some of the mounds he found the percentage of the humeri (Olecranon) perforation to be as high as 63.6. In others it was much lower. Most of his crania are of brachycephalic type.

Mr. Holmes, in his characteristic, thorough manner, handles the pottery of the collection. He thinks that from the ceramics one can learn more concerning a tribe than by any other means. He is of the opinion that nearly all the Florida mounds are comparatively recent. Mr. Moore, while admitting that several are, is of the opinion that the bulk of them are prehistoric.

The careful and extensive work done by Mr. Moore and his party must be highly considered by all archæologists. His observations will go far towards solving the problems connected with Florida aborigines. We wish that he will continue his labors in other Southern fields. Little is known about primitive man of the South. Mr. Moore has a great field before him, and we trust that he will avail himself of the opportunities presented.

His book should be in every archæologist's library.

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"Dolls of the Tusayan Indians." By J. Walter Fewkes. Reprinted from the "Internationales Archiv fuer Ethnographie," Vol. VII, 1894.

Mr. Fewkes report is beautifully illustrated with colored plates of the dolls and stone fetiches used by the Tusayan Indians. The material which serves as a basis for the report was collected in Wal-pi while Mr. Fewkes was attached to the Hemenway Southwestern Archæological Expedition. The dolls are made of wood, and are profusely decorated with feathers, cloth, string, etc.

These carved wooden images are made in great numbers by the Tusayan Indians and present most instructive objects for the study of symbolic decoration. They are interesting, as affording valuable information in regard to the Ho-pi conception of their mythological personages. Mr. Fewkes cites the effigies of Easter Island, of Vancouver Island. He well says: "It is extremely difficult in the study of the religions of primitive people to draw a sharp

line of demarcation between pure idols, which are worshiped, and those figures of the same which have a purely secular character. It can hardly be said that these dolls are worshipped at the present day. Still, it by no means follows that they may not be copies of images which have been worshipped, although they now have come to a strictly secular use. The corresponding images which appear in sacred ceremonies no doubt have a sacred character from their antiquity, but we can hardly declare that even these images are worshipped. We may rather say that they are revered for their age. Symbolic figures of all kinds, as representatives of something more than purely secular objects, but if similar figures were ever worshipped, at the present day they have lost their character. The resemblance between the words idol and doll are significant."

Mr. Fewkes does not believe that there is a feeling of veneration for the wooden images. With the stone fetishes it is different. He presents 43 of the dolls. He urges the comparison of these figures and the ceremonies in which they are used with similar practices of people of antiquity. The volume may be procured through Houghton, Mifflin & Co., Boston.

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"Folk-Tales of Angola." Fifty tales, with Ki-Mbundu text; literal English translations; introduction and notes. Collected and edited by Heli Chatelain. Houghton, Mifflin & Co., Boston. \$3.00. (Published for the American Folk-Lore Society.)

Students interested in African Folk-Lore will find this volume of great value. Those who have read Schweinfurth and other writers' works upon tribes of the Dark Continent have doubtless wished for a reliable publication, setting forth the stories, traditions, and songs of Angola. It is only by literal translations of the Folk-

Lore of the people that students can ascertain their motives, thoughts and beliefs. Mr. Chatelain, himself well acquainted with several African tongues, has presented ethnologists with one of the most trustworthy publications in the literature of Folk-Lore.

The African and English of each story are placed upon opposite pages. One can easily gain an idea of the language from this arrangement.

The book will stand as a work of reference. The tales are certainly unique and original, and but few of them have parallels in the stories of savages of other parts of the world.

Tale XXVIII.—"I often tell of Mr. Elephant and Mr. Frog, who were courting at one house. One day Mr. Frog spoke to the sweetheart of Mr. Elephant, saying: 'Mr. Elephant is my horse.' Mr. Elephant, when he came at night; then the girls tell him, saying: 'Thou art the horse of Mr. Frog.'

"Mr. Elephant then goes to Mr. Frog's, saying; 'Didst thou tell my sweetheart that I am thy horse?' Mr. Frog says: No; I did not say so.' They go together to find the sweetheart of Mr. Elephant.

"On the way, Mr. Frog told Mr. Elephant, saying: 'Grandfather, I have not strength to walk; let me get upon thy back!' Mr. Elephant said: 'Get up, my grandson.' Mr. Frog then goes up.

"When a while passed, he told Mr. Elephant: 'Grandfather, I am going to fall; let me seek small cords to bind thee in the mouth.' Mr. Elephant consents. \* \* \* 'Let me seek a green twig to fan the mosquitos off thee.' Mr. Elephant says: 'Go.' He then fetches the twig

"When they were about to arrive, the girls saw them, and they went to meet them with shouting, saying: 'Thou, Mr. Elephant, art the horse indeed of Mr. Frog.'"



## COLLECTOR'S DEPARTMENT.

**Suggestions by an Eastern Museum Assistant.**

Have you ever explored a mound or grave? If your aim was to learn something about the objects which you sought after; if you were investigating into the story of a vanished people, your pursuit was not only not in vain but was scientific in its character and worthy of much praise. Let me illustrate by a specific example. Let us suppose that you have explored a single grave or made a thorough exploration of the surface of a field. As a result you have obtained several objects of stone and copper; perhaps a few bones or charred bits of wood, or teeth of animals, or fragments of pottery. Each and all of these objects, however fragmentary, tell their story. They are the open books from which we may learn a very great deal concerning a people whose story is well worth reading, and from whom may not despair of learning something.

Before we can decipher aright these strange *books* written in such a strange and rude language, however, we must be able to have such a command over several of the sciences as will enable us to get at the whole and complete story. To point out a few of these auxiliaries, and to call attention to their importance is the object of this present paper. At a future time I shall endeavor to suggest various points of information, we may hope to discover, and how best we may go about that discovery.

The first and undoubtedly the most important assistant to the archæologist is a thorough knowledge of Geology and its allied branches. Space would not permit me, of course, to treat of the importance of this science in detail. I can only give

a few examples to illustrate my point. Say, for instance, in opening a grave or mound, you encounter a surface layer of loam, the result of many years of decayed vegetable matter, a knowledge of Geology will enable you to compute with some degree of satisfaction the age of the grave or mound; for the amount of loam deposited by vegetable matter per century has been carefully computed. Let us again take another example. A few years ago a stone hearth was found in one of the banks of the Little Miami River, in Ohio, at a depth of fourteen feet beneath the surface. In other words, this hearth had been used by man when the valley presented a far different appearance from what it does now, and since that time the river, for some geological cause, has flowed over the hearth, and in constant or periodic inundations has deposited fourteen feet of silt, or loam.

Objects of human workmanship have been found under a 60-foot deposit of silt in the Lower Mississippi basin. Geologists have computed the number of inches of alluvial deposit formed per century. In fact the whole discussion of the momentous question of the supposed Palæolithic Man is purely geological; and when we consider the important part played by Geology in the exploration of the caves of England; the peat bogs of Ireland; the *kjökkenmödding* of Denmark; the lacustrine deposits of Switzerland, and the glacial drift gravels of France, we can only say that a knowledge of Geology is absolutely essential to every student of Archæology. As man cannot exist apart from the Earth, so his history cannot be understood without a knowledge of the Earth's history.

Leading out of Geology, and forming subdivisions are several branches, all important and necessary aids. Palæontology enables us to get at the age of all fossil remains, and thus, often is of vital importance. For instance, the remains of man and his work have been found in England and other places with the remains of extinct species of animals, and under such conditions as to lead archæologists to conclude that man was co-existent with those animals, and thus the great antiquity of man has been proved. In a similar manner a knowledge of Petrography enables us to to classify the various objects of stone, and often to learn of their original origin. Allied to Petrography is the study of Mineralogy, from a knowledge of which we can identify the different minerals which played such an important part in the life of the early people, as it does to-day. As the localities of minerals are pretty well defined, when we find a certain mineral in a grave or mound, as for example, a piece of obsidian from Yellowstone Park, or a piece of mica from South Carolina in an Ohio mound, we are led to infer that either the people of Ohio visited those localities or bartered with people who visited there.

The other branches of Chemistry, of which Mineralogy is but one, are also of great assistance. Our aborigines were in possession of many facts of Chemistry, and if we would study their life understandingly, we must have the same knowledge. A few examples will suffice. The production of red and yellow ochre, which was extensively used by the Indians, was from hematite climonite, common minerals. A knowledge of chemistry enables us to analyze the various dyes; to account for many of the changes which take place in various objects, etc.

Another important aid is Natural History, including Zoology and Botany. From these we are enabled to identify the numerous remains of animals and plants, so often present in the graves and mounds. Of especial value, is a knowledge of Osteology, as

nearly all the animal remains consist of bones, and thus we learn a great deal concerning the animals used for food and domestication.

And so a number of other studies might be mentioned which would be of importance, such as drawing, surveying, religions, ancient and classical art, etc., but enough has been said, I hope, to show the would-be archæologist that before he can make any true progress he must be able to command many studies not related to Archæology, but serving as aids and assistants of the most important character.

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### INFORMATION FOR COLLECTORS.

A. F. BERLIN.

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(Foot notes by the EDITOR.)

(Continued.)

We wish, in this number of THE ARCHÆOLOGIST, to tell our readers about the much sought for and interesting pipes made by our pre-historic people. They, like their successors, the Whites, to whom they taught this habit, were much addicted to smoking, which fact is attested by the many objects found used for this purpose. Not alone was tobacco used but there is evidence that other herbs having narcotic properties often took the place of tobacco.\*

The first to mention will be the "monitor"-shaped, or those pipes having a flat or slightly curved base with the bowl, often plain and round, which is called its simple or primitive form, projecting from the centre, and through one end of which was drilled a narrow hole, about the size of a straw, to the hollow of the bowl, serving as a mouth-piece, while the other end at the same time did well as a handle held by the smoker.† The carved specimens are often

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\* Red willow bark or sumach leaves mixed with a little tobacco, called Kinnikinnick.

† The Smithsonian, Peabody, Field Columbian, and seven State museums contain a total of over five hundred of these "monitor" or "platform" pipes.

of an elaborate form representing the human head, animals, birds and reptiles. Squier and Davis figure in "Ancient Monuments" a pipe of this type with a plain bowl around which is encircled a serpent. They found this peculiar type of pipe in considerable numbers while surveying the ancient earth-works in Ohio, and have described and figured them in Volume I, Smithsonian Contributions to Knowledge. Since then many other fine specimens have been discovered. From one of the hearths of a number of mounds, situated four miles north of Chillicothe, Ohio, these explorers took nearly 200 stone pipes of this peculiar form, many of which were damaged by the action of fire.\* The material from which most all these pipes were made is said to be a compact slate. Argillaceous ironstone, ferruginous chlorite and calcareous minerals, for which information the writer is indebted to the valuable work entitled "Flint Chips," by E. T. Stevens. This test was made on a number found by Squier and Davis, and belonging to the Blackmore Museum at Salisbury, England, by Prof. A. H. Church, who found them to consist of the softer materials above described.

Dr. Charles Rau, in his admirable work, "Smithsonian Contributions to Knowledge," No. 287, p. 45, says: "Nevertheless they constitute the most remarkable class of aboriginal products of art thus far discovered; for some of them are so skillfully executed that a modern artist, notwithstanding his far superior metallic tools, would find no little difficulty in reproducing them." Rather a bold statement when we consider the softness of the material from which they were made.†

\* These were nearly all effigy pipes. The Blackmore Museum, near London, now contains them. They constitute the finest exhibit of American pipes in the world. It would require the combined collection of the three largest American museums to surpass them. In other objects the American museums are far superior to the Blackmore.

† The only effigy which is the equal of modern ordinary sculpture is the duck-fish pipe found in the effigy mound of the Hopewell Group, '92.

The supposition that many of these pipes are close imitations of some of the fauna found in the United States is refuted by other archaeologists and naturalists who claim that although Squier and Davis go so far in their admiration (Ancient Monuments, p. 272), as to say that, so far as fidelity is concerned, many of them (*i. e.* animal carvings) deserve to rank by the side of the best efforts of the artist naturalists in our own day—a statement which is simply preposterous. So far, in point of fact, is this from being true that an examination of the series of animal sculptures cannot fail to convince any one, who is even tolerably well acquainted with our common birds and animals, that it is simply impossible to recognize specific features in the great majority of them. They were either not intended to be copies of particular species, or, if so intended, the artist's skill was wholly inadequate for his purpose." (Henshaw in "Animal Carvings from the Mounds of the Mississippi Valley," Annual Report of the Bureau of Ethnology, 1880-'81, p. 148.)

Dr. Coues, the eminent naturalist, and the prominent Ornithologist, Mr. Ridgway, bear out the statements made by Mr. Henshaw.

Two noted pipes, which it is claimed well represent the mammoth or elephant, are owned and displayed in the museum of the Davenport Academy of Science, at Davenport, Iowa. They represent the elephantine-shaped animal standing one on a straight base; the other on a base slightly curved. The bowl is cut down from the back of the head into the front legs, and the mouth-piece in both cases that part of the base facing the head of the animal. They were brought to light by a German Lutheran minister named Gass, in Iowa, who claims to have found them not very far from where he lived. This gentleman has also discovered curious stone tablets, upon which are figures suggesting in a rude manner the mastodon. The authenticity of these pipes having been questioned for good reasons,—see Report Bureau of Eth-

nology, 1880-'81, p. 154,—brought out a so-called vindication of them by a Mr. Charles E. Putnam, then President of the Davenport Academy of Natural Sciences; but in spite of this brilliant attempt doubt still rests upon their authenticity. How can it be otherwise when the writer of this detected a number of years ago this same Mr. Gass, this finder of the so-called elephant pipes, passing upon another collector, spurious pipes and other objects for true relics.

These mound pipes, so-called because the greater part of them have been taken from mounds, and, which it is asserted, were only made in or near the present State of Ohio are nearly all of small size, and remarkable for the small capacity of the bowl.\* This feature is noticeable also in other pipes about to be described.

There are other forms of animal pipes made in imitation of birds, mammals and amphibians; and sometimes the human figure, which are distinct from the so-called "mound" or "monitor" type. They are in very nearly all cases large and unwieldy objects, and no doubt belong to the order of "calumet" pipes, used on occasions or ceremony or in solemn meetings, in the forming of treaties; the ceding of lands, etc. We all know that on such occasions the pipe, with its attending tobacco, played a principal part, and nothing could be done without its presence.

Although it is believed that these pipes were owned by communities, single individuals, such as chiefs and medicine men may have been owners. They have been taken from graves holding but a single occupant. In Vol. I, p. 144, of THE ARCHÆOLOGIST is figured a style of pipe weighing one pound five ounces, which, on account of its weight, may be termed a calumet pipe. Although then in possession of a

chief, does not prove that he was the sole owner. Similar unwieldy pipes shown by Col. C. C. Jones, in his "Antiquities of the Southern Indians", plate XXIII, facing p. 104, are regarded by him as "calumets". In nearly all of them the bottom is flat, and the bowl at right angles with the stem. The material used in the manufacture of these "pipes of peace" was oolite, serpentine, sandstone, gneiss, and very often a softer substance as steatite as soapstone. This material was worked very easily.

A few years ago were living in one of the Southern States, I think, North Carolina, two or three full blooded Cherokee Indians, who carved with a steel blade, from a hard slate, artistic animal pipes. The name of the principal maker was Chic-a-le-lah. These pipes were sold as modern productions, and they grace every collection in which they are placed. They represent the common form of pipe, *i. e.* the bowl placed at right angles with the stem, having the animal cut either into a crow, bear, raccoon, etc., resting on the stem and facing the smoker. The writer is indebted for this interesting information to Mr. L. V. McWhorter, of Berlin, West Virginia, who handled a number of these peculiar implements. They weigh but several ounces, and would never have been used as "pipes of peace".

Equally interesting, and perhaps more so, is the very rare pipe representing the human form in a sitting position, and which are termed "idol pipes." One of the most artistic specimens ever found is figured in three positions in THE ARCHÆOLOGIST, Vol. I, p. 108. It will not be out of place here, to quote the interesting statement concerning these finely wrought specimens from "Antiquities of the Southern Indians," by C. C. Jones, p. 401, who writes: "First in interest and in art is the IDOL-PIPE. This is rarely seen, and only in localities where, in the distant parts, dwelt people to all appearances more permanent in their seats and tribal organizations; more agricultural in their pursuits; more

\* This type exists in Illinois, Indiana, Michigan, Wisconsin, West Virginia, Kentucky and rarely in Tennessee, Eastern Missouri and Arkansas. It seems confined to a region three hundred and fifty miles in diameter, having Cincinnati as its center.



addicted to the construction of large tumuli; and superior in their degree of semi-civilization to the nomads who occupied the soil at the date of European colonization. Specimens of such pipes are as infrequent as stone images, and it is probable that they should both be referred in their origin, to the handiwork and superstition of the primitive men who threw up those large mounds which tower along the banks of the Etowah, and lift their imposing forms from out the level of several other valleys in Georgia. They are always associated, so far as our knowledge extends, with the large pentagonal and quadrangular mounds, and with those older monuments—be they watch-towers, sepulchral tumuli, temples, consecrated spaces, enclosed areas, defensive works or play-grounds—of whose age and objects the later Indian tribes cherished not even a tradition.”

(*To be continued.*)

### RECENT DISCOVERIES.

Up to June 20th the following finds have been reported by the various papers of the United States ;

Modern and ancient relics have been found in Indian graves near Olympia, Washington. The finds are extensive.

The chief of the Crees has been interviewed concerning the Sun Dance of his tribe, soon to be held. He claims that if his people enter into the ceremonies with fortitude and resolution, their present ills, troubles and sickness will cease.

At Mount Darwin, in the vicinity of Death Valley, California, another cavern full of skeletons and prehistoric relics has been discovered. The details of the find are meagre and unsatisfactory.

A deserted city found in the mountains of Mexico, not far from Mapimi, is attracting the attention of the press all over the United States. Archæologists recently sent from the Museum of Natural History of New York, and the Museum of the Uni-

versity of Philadelphia to Mexico, will investigate the find. The editor of the *ARCHÆOLOGIST* is in correspondence relative to securing all the facts for our readers.

Central Asia is a rich and unexplored field for the archæologist. A long article published in the *Pittsburgh Dispatch* refers to mummies, ruins, tombs, etc., of the oasis of Tchertchen. It calls special attention to two cities which have been buried in the sands three thousand years, and which were partly uncovered by shifting sand storms.

A mound opened near Sing Sing, N. Y., yielded skeletons and relics in great profusion.

Indian Knoll, at Pompey Centre, N. Y., comes to the front with medals, bones, crosses, arrow-heads, etc., mostly modern (but some ancient), as the result of an exploration of the Onondaga graves.

The *Washington Post* publishes a two-column article relative to a soap-stone quarry in the neighborhood of Clifton, Va. The article is somewhat sensational, but contains matter of interest. It seems that Mr. Dinwiddie, of the Bureau of Ethnology, and Mr. Mercer, of the University of Pennsylvania Museum, arrived at the quarry site within an hour of each other, and that a gentlemanly discussion took place as to which institution should have the right of exploration. (We should have enjoyed being present.)

During the exploration many photographs were taken of the pits, refuse heaps, etc. The following taken from the article is self-explanatory :

“An especial feature of the excavation is the presence of a vein of bluestone, which was too hard for working into vessels. The Indians tried to cut through this, but after what must have been many months of hard labor, they gave this up as a fruitless task. They had, however, cut out great bowl-ers, some of which weighed as much as two tons, and heaved them away to the dump heap. All along the rock they cut tremendous grooves, which still bear the scars of their chisels. When this was aban-

doned they tried to dig around it to the left, and excavated under the green stone wall four and one-half feet. Meeting with no success in this direction, they turned to the right, where they rose over the green stone, and, passing it, made another excavation twenty feet long and over ten feet deep.

"The blocks were taken out in circular form, varying from six inches in diameter up to two feet. The shrewdest mathematician could not have marked out these blocks with greater economy. They began at the top of a new surface, which had been stripped for a few feet, and worked downward. Therefore, the floor of the trench is covered with the scars of the work. In a few instances, bosses were left entire or partly worked off. The bowls being cut vertically to the plane of cleavage, generally came off easily when the surrounding material had been chiseled away. A peculiarity of the mine is that the walls and the floor do not have a single mark from a grooved tool.

"The broken bowls and many of the stumps and scars have been taken away. Casts have been made of others. A few of the larger blocks taken from this quarry are now at the Smithsonian Institution. The bowls are at the Geological Survey, and will probably be put on exhibition."

A mound opened near Savannah, Ga., yielded whole pottery, celts, perfect crania, copper plates, beads and carved shells. We will endeavor to secure the details of the discovery for the August number of the ARCHÆOLOGIST.

On Raymond Hill, Pasadena, Cal., many mortars, celts, etc., were uncovered in April. The site was a favorite camping ground in pre-Columbian times. The collectors of the neighborhood were on hand *en masse*. A few obsidian blades, knives and spear-heads were among the village debris.

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#### CALIFORNIA'S MOUND-BUILDERS.

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STANFORD UNIVERSITY STUDENTS MAKING AN INTERESTING SEARCH.

The progressive students of Sanford have begun a scientific exploration of the great

mound near Castro station, some four miles east of the university grounds. They found implements, ornaments, the remains of camp-fires, and other evidences which tell the story of the daily life of these people who were, but are not.

The mound lies with its longer axis north and south, and measures 470 feet in length by 320 in width, having an area of nearly two acres. In height it ranges from about two feet at the southern end to ten feet at its highest point, near the northern extremity.

The soil used in its construction was, originally, the ordinary black adobe, such as is found in the fields surrounding the mound, but now rendered much lighter by the admixture of the ashes from a thousand camp-fires. It was evidently taken from the territory immediately surrounding the mound, and in process of time the great trench thus formed became a swamp, with its characteristic growth of long grasses and scrubby willows.

Diligent inquiry among the older residents of the neighborhood has failed to elicit anything trustworthy concerning its history. There is a dim tradition, indeed, that when this region was first visited by whites, the mound marked the site of a flourishing Indian village, but it is impossible to say just how much credence should be given to this story. Nothing as yet taken from the mound would indicate that its builders had ever had any dealings with the representatives of civilization — *San Francisco Examiner*.

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#### MANAGER'S CORNER.

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Any reader who will send us four new yearly subscribers, will receive the ARCHÆOLOGIST one year free. \*

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If you know of persons that would be likely to subscribe, please send us their addresses, and we will mail them sample copies. \*

# THE ARCHÆOLOGIST.

VOL. II.

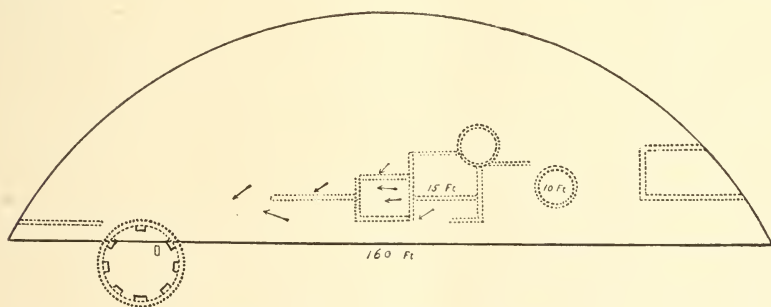
WATERLOO, INDIANA, AUGUST, 1894.

No. 8

## PRE-HISTORIC MAN IN UTAH.

HENRY MONTGOMERY, M. A., B. SC.

THERE has recently been brought to Salt Lake City a rare collection of pre-historic remains, said to have been collected by Messrs. C. B. Lang and Neilsen during the past three months in San Juan County, Southeastern Utah. It consists, principally, of seven almost perfect, mummified or desiccated human bodies, and the head of another; one mummified turkey; two mummified field mice, several human skulls, wooden implements, sandals, cloth, tow or yucca fibre, mats, baskets, maize, axes, arrow-points, a wooden pail, gourd fruits, pipes, shell and bone beads. Besides the foregoing, there are a few vessels of pottery, some of which came from the Montezuma Valley in Colorado. There can be no reasonable doubt that the articles have been collected as alleged, in the caves of Southeastern Utah and vicinity.

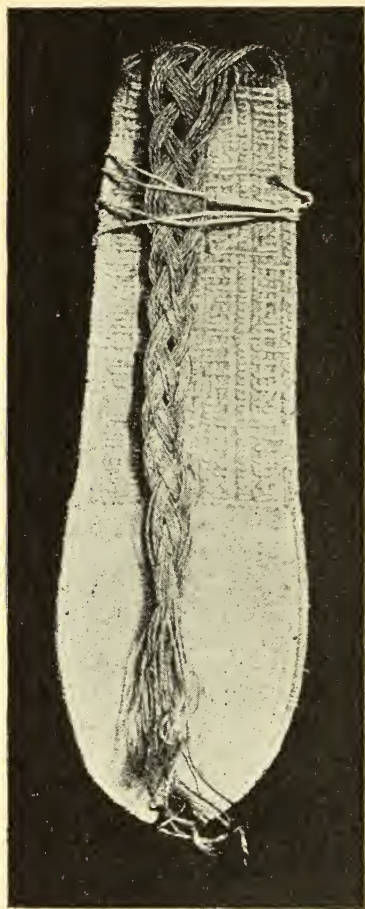


Ground Plan of Cave No. 1, San Juan County, Utah.

The greater part of the collection is said to have been found in one cave in the face of a cliff, about fifty miles south of Moab and forty miles north of Bluff City. This cave is only some forty feet above the valley, and is readily accessible. Its mouth is about 160 feet in width by twenty feet in height, and the latter gradually decreases as it extends inwards towards its terminus, which is about fifty feet from the entrance. Within the cave were the dilapidated ruins of stone houses. These ruins contained earthen vessels, sandals and other relics, such as have been found in similar stone ruins

in the cliff caves of Colorado, Utah and Arizona. But when these houses had been completely cleared away and excavation made, at a depth of from three to five feet beneath the floors of the aforesaid stone houses, four mummies and other relics were found. These mummies consist of the dried bodies of one large man about six feet in height, a woman of good size, and two young persons, the smaller of whom appears to have been about thirteen or fourteen years old at the time of death.

They are all remarkably well preserved, and their heads are provided with coarse, black hair, particularly abundant on the man and the boy. Small portions of garments are present in the form of a robe made of yucca cloth and furs; and there are woven, well-made, yucca sandals upon the feet. The boy's feet, however, are furnished above with loose buckskin coverings, but have no sandals or soles of any kind. Two pairs of unworn sandals of superior workmanship, together with some bunches of yucca, or soapwort tow or fibre, of which the sandals were made, were found carefully wrapped in a tanned skin beside the body of the woman. A number of rude, stone arrow-points, with short, wooden (probably willow) handles tied to them by animal sinew; also one wooden pipe and several bone awls and skewers were found with the body of the man. The pipe is about an inch and one-eighth in diameter and two and one-half inches in length, including the stem. The latter consists of a short piece of bone, probably a part of the hollow ulna of a wing of a large bird. It is fastened into the bowl of the pipe by means of some sort of black cement or fire-proof material, which is also used to form a thick lining for the bowl. Large and



A Sandal of Yucca Fibre from Căve No. 1.

small gourds were also with these four mummies. One of the gourds has a handle of yucca cord stretched across its circular mouth opening, thus forming a convenient vessel, which was found full of corn in good condition. Besides, there was a wooden implement over forty-six inches long, consisting of handle and blade or flat portion, as shown in the accompanying figure. This is made of very hard wood, and it was probably used as a flail for beating out the yucca or soap-



wort into tow or fibres, suitable for the manufacture of thread, cloth and sandals. Perhaps it may also have been used as a spade for digging herbs and for gardening. All the bodies were, and are still, in a crouching posture, the knees being drawn upwards close to the breast. In the same cave, in different parts of it, three other mum-

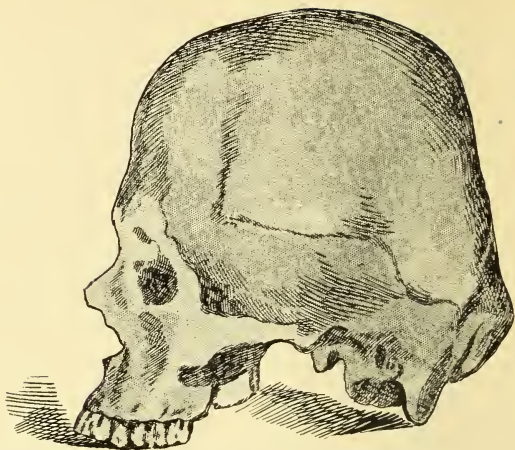
Boy Mummy and Relics from Cave No. 1.



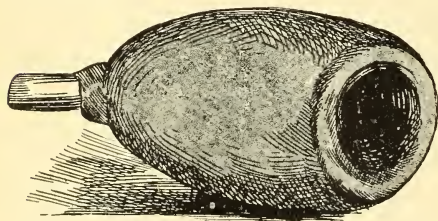
mies were found, one of which was two feet beneath the wall of a stone house, and had with him six rude, stone arrow-points with short, wooden handles, being in all respects similar to those previously described as found with the largest of the four mummies.

This mummy, which was two feet beneath the stone house, had the hair closely cut from the front half of the head, thus leaving the back hair only, which helped somewhat to give a resemblance to the face and head of a Chinese. Three human skulls were likewise dug up in other parts of this cave, but they were outside the limits of the houses.

A second large cave, about a mile distant from the first, was explored by the same party, and found to contain certain remains which are of great interest. Amongst these may be named the following: A large male mummy; the dried-up body of a turkey; one wooden spade or flail about forty-three inches in length; one wooden and rawhide *atlatl*; one wooden pipe with short, bone stem, almost an exact counterpart of the one described from the first cave; one small bowl of a pipe made of catlinite or red "pipestone" from Minnesota, and forty-five artistically formed stone arrow-points of a different form and finish from those found in the cave previously described. This mummy is of special interest, no less because of its remarkably good state of preservation, than of its facial features. It is the extraordinarily well-preserved body of a large man of fifty or sixty years, with a rich supply of grayish, brown hair, that appears to have been cut, and a mustache and some whiskers upon the face. Like all the other mummies, this one has the knees drawn up to the breast. He is also clothed with woven yucca cloth and bearskin, and with a robe made of yucca cords and the skins of various animals. As he sits upright with his back against the wall, one feels a strong desire to speak to him and converse with him about the mysteries of the past, as well as the mysteries of his present. One would like to



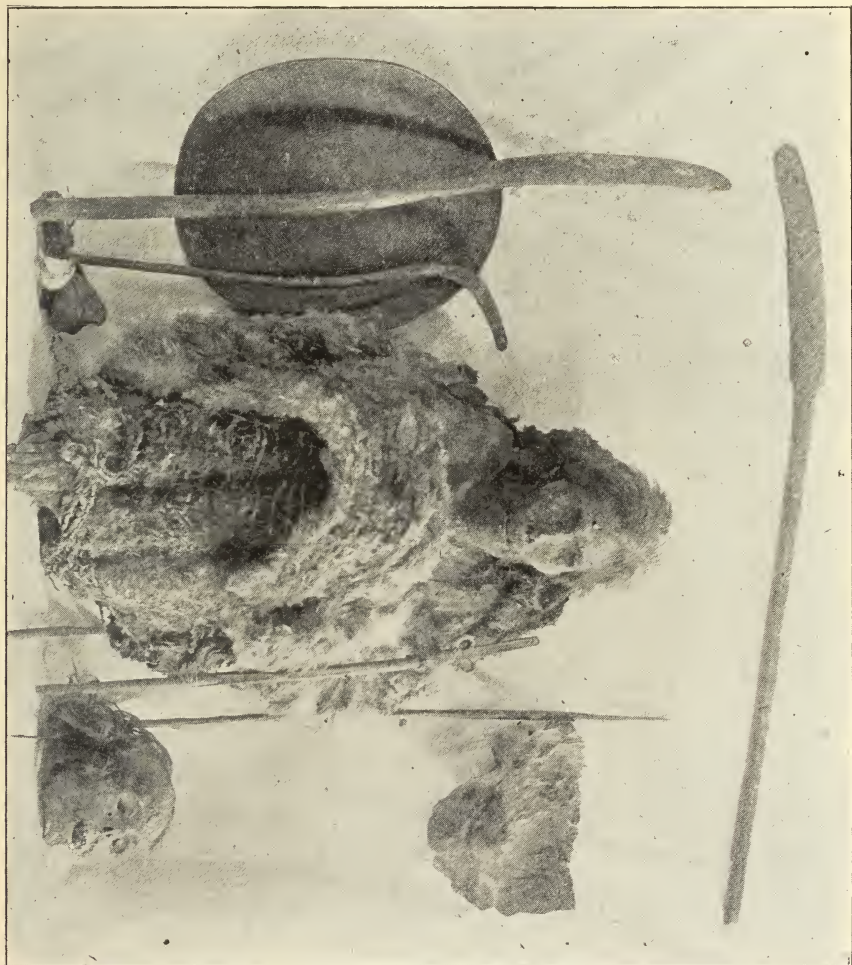
Side View of Brachycephalic Skull showing artificial flattening. From a Cliff House in Grand Co., Utah.  
(Mr. Sault's Collection.)



Wooden Pipe, from Cave No. 2, San Juan County, Utah.

learn from his lips something of the times in which he lived, and of the customs, extent and position of his race. He seems to differ from most of the others as to the face, hair and the shape of the head. His skin appears to indicate that he lived much within doors, and had not been greatly exposed to the action of the sun and the winds. His

head approaches that of a European or white, the cephalic index being almost seventy-nine. Yet, his clothing is similar to that of the other mummies, consisting of woven yucca cloth and skins, made in much the same manner. With him were found two small skin pouches or sacks containing herbaceous remains, and several sub-



Adult Mummy and Accompanying Objects from Cave No. 2.

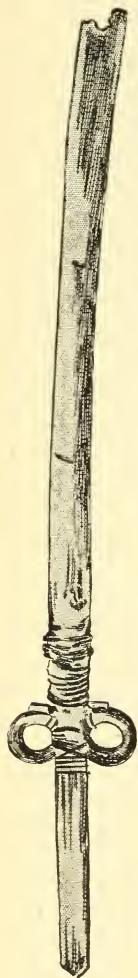
stances wrapped and tied very carefully. The latter are, as yet, undetermined; but they may, possibly, be medicinal in character. In one of the small sacks, which was made of bearskin, there was an article having some resemblance to a pipe, and made of a finely polished piece of onyx marble, and a piece of polished black material



closely resembling buffalo horn, both having a cement substance similar to that before mentioned in describing the two wooden pipes. When discovered, the face of this mummy was covered with a wide, shallow, circular basket, over which a portion of the robe had been drawn. The red stone pipe, the wooden pipe, *atlatl*, turkey, well-formed arrow-points and wooden flail were dug up in different places in the second cave, and were, therefore, not very close to the mummy. Is is worthy of note, that this small, straight, catlinite stone pipe is precisely similar to those which I have often found carefully buried

in the sepulture mounds of North Dakota and Minnesota, and, at the same time, it is the first specimen of the kind that I have ever known to be found in Utah. As the catlinite, or "red pipe-stone," is not known in this region, this particular specimen must have been brought from the vicinity of Minnesota. Its occurrence in Utah may, or may not, afford evidence of intercourse between these "cave-dwellers" and the Northeastern "mound-builders." It may, likewise, be worthy of mention, that the Utah wooden pipes have the same shape and size as the horn pipes found in the mounds of North Dakota. The *atlatl*, or throwing stick, has the two loops of rawhide and the shallow gutter, and is, I think, the third of the kind ever found, and the first *atlatl* reported from Utah.

With regard to the entire collection, its most striking feature is the high state of preservation of the bodies, and, indeed, of all the specimens. Skeletons of these pre-historic people are not very uncommon, and a few mummies have been found in Colorado and Utah. But these are in a better condition than usual. That they should be well preserved is not surprising to any one familiar with the climatic and other natural conditions of Southeastern Utah. A large part of this western country is generally known to be relatively dry, and also equable in temperature. But in San Juan County it is much less moist than in Salt Lake City or Denver. In fact, rain and snow are almost entirely unknown. When rain occurs, it is in a short, quick shower, which rapidly runs off the high ground and soon disappears. The atmosphere is intensely dry, and the interior of cliff caves usually may be said to be equally destitute of moisture. Again, the temperature of these caves is subject to very little change, practically none, throughout the entire year. I have kept the air-dried carcass of a bear for more than two years in Salt Lake City, and no offensive odor whatever was emitted from it. It is not wonderful, therefore, that human and other animal bodies should be easily preserved by desiccation in Southeastern Utah, especially when they are placed in a drying, absorbent soil, and in caves where the temperature is not subject to sudden, frequent or great changes.



Medicine Stick  
or Flail, from  
Cave No. 2,  
San Juan Co.

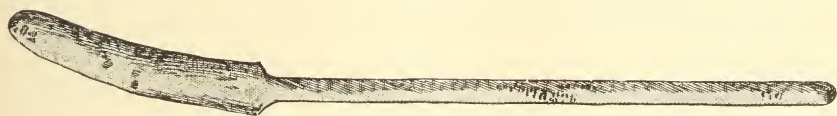


It has been claimed that these pre-historic people differed very greatly from the people commonly known as cliff-dwellers. This I do not believe. They wore the same kind of clothing, made of skins and of woven yucca cloth and feathers, and had almost the same kind of sandals upon their feet. They also had similar wooden flails and spades, as well as baskets, gourds and corn; and, in addition to all



Flail, from Cave No. 3.

this, they were buried in much the same posture as many of the so-called cliff-dwellers. It is true their skulls are long or dolichocephalous and mesocephalous, while those of many cliff-dwellers are wide and short, or brachycephalous. This distinction is neither imaginary nor feeble, but it is most marked. Having made careful measurements of all the heads and skulls in this collection, I find the cranial index of each to be as follows: 73.5, 76, 73.6, 78, 75.8, 72.8, 78 and 78.8 for the mummies; and 71.6, 71.5, 73.7 and 70 for the skulls. Of course, owing to the presence of the hair and skin in the case of the mummies, the measurements cannot be regarded as very exact, yet they are very close to the actual dimensions of the skulls,



Flail, from Cave No. 3.

and for practical purposes may be relied upon, so far as there is any value to be attached to the relative lengths of the transverse and antero-posterior diameters of the cranium. The first four represent the heads of the mummies found together beneath the houses in cave No. 1. The last cranial index (78.8) is that of the male mummy from cave No. 2.

It may be noticed that their cranial index ranges from about seventy to seventy-eight, which is the same as in the average North American Indian, while many of the skulls found in or near the cliff-houses range from ninety-one to ninety-seven. But to this it must be said, that the latter results are due to artificial malformation produced during life. This extraordinary shortness is due to a flattening of the back of the skull. It is not a natural condition, but one which has resulted from a custom that may have been practiced by a few individuals or families, or, perhaps, at a slightly different period in the history of the same people. In this connection may be mentioned the Flathead Indians of the present time, who practice flattening of the top of the head during childhood. Moreover, I have myself, during explorations in Utah, personally unearthed skulls of both kinds, which had been buried together, and I have taken the

skulls with artificially flattened occiputs from graves five or six feet beneath the walls and floors of the houses. Although for several years seeking an explanation of this occurrence, I have not yet been able thoroughly to satisfy myself regarding it. There are many mysteries to be solved; many difficult questions to be answered. Nevertheless, much has already been learned about the civilization of these people. The facts are evident, that they were comparatively civilized; they were agriculturists; they raised corn, gourds of different kinds, and it is probable, also, potatoes and other vegetables and fruits; they practiced irrigation, both intelligently and extensively; they had architectural knowledge and skill; they made the best kind of pottery; they were people of large stature; were exceedingly numerous, and constituted a large nation in possession of Utah's valleys and mountains, and almost all the Southwestern portion of this Continent.

*(To be continued.)*

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## SOME ASPECTS OF INDIAN MUSIC AND OF ITS STUDY.

ALICE C. FLETCHER.

*(Conclusion.)*

INDIAN music, and I may add, all folk-music, can be studied in two ways: as music, that is, as an expression of human feeling in melodic form; or the physical peculiarities of its tones can be registered and analyzed. These two methods of study should not be confused or confounded, as they lie along different lines. The purely physical aspects of Indian Music lie outside the scope of this paper.

In my field work, while transcribing Indian songs, I made many experiments in notation, for I was at first a slave to my previous training, and the inaccuracies of pitch which I heard seemed to me a matter of importance so I invented signs, which I used when I wished to indicate a variation of a comma here, or a comma there, according as the singer flatted or sharpened a tone, with the result, that I had as many differing records of a song as the number of persons who sang it to me. This set me to thinking and to listening with more freedom. I sang often with the people, and sought to let myself be led by them. On my various returns from the field, I recorded the variations of untrained singers of my own race, and, to my surprise, I found them equally numerous. I came to the conclusion that were I to transcribe all the minute deviations from pitch of the average singer, I should present a caricature rather than a true picture of what was a familiar tune. This conviction sent me back to my note-books on Indian songs, and I sought to find what was common in my many-varied records, and thus I discerned what the Indians were aiming to sing. Having cleared the songs of these

personal imperfections and common mannerisms, upon my singing them they were pronounced correct by each and all of the Indians who had sung them to me.

In consequence of these experiments, I returned to the notation in common use for the transcription of Indian songs. This notation is intelligible; a most important point. It is liable to no misconstruction, and the record is available to every one without the expenditure of time and effort in translation. I need hardly say that it is equally adapted to the voice, the piano, the organ, the violin, the flute, or any other instrument having the requisite range. The score played upon any instrument will truthfully give the music. The notes tell what the Indian expressed in melodic form. But no instrument can reproduce the human voice. And songs played upon the violin, or flute, or piano will not imitate the Indian voice peculiarities. The personal element, the distinctive qualities of tone, cannot be represented by any mechanical device we possess. Not even with exactness by the phonograph, nor by any system of notation however elaborate. This personal element in singing, however, is quite apart from the music itself. "Home, Sweet Home," as given by Jenny Lind, and as ground out by a hand-organ, produces very different sensations on the listener, but the tune is the same in both cases.

To try to imitate the sounds the Indian makes in singing and to reproduce his aberrations from pitch as the principle or even an important factor in his music, would be to fall into serious error. We would fail to represent with any clearness what the Indian was trying to express by his song. Prof. Stumpf, of the University of Munich, an authority on folk-music, in a recent article in reference to the transcription of some songs from phonographic cylinders, when the attempt had been made to record these aberrations, after pointing out the error of assuming that if we could represent the exact pitch of tone, we should then have obtained the musical intent of the song or singer, says: "Let us imagine any person we please in this country, set down before a phonograph and the melodies sung by him reproduced and noted as these songs have been, i. e. representing every aberration of a quarter tone from the true pitch by the harmonium key next above or below it, we should certainly get melodies quite different from those set down in our own song books and which form the expression of our own musical consciousness." I wish that such an experiment might be tried right here and that each one of us might sing a song into a graphophone, I think the reconstruction from the record just as it stood could not fail to prove that literalism is liable to take one a long way off from the truth.

In the monograph on Omaha Indian Songs published recently by the Peabody Museum of American Archaeology and Ethnology of Harvard University, the songs appear as harmonized. This harmonization has not been for the purpose of dressing up the melodies, for modernizing or changing them in any way, or for the importa-

tion into them of any of our own notions. No one who seriously and intelligently studies this presentation can fall into so grave an error as to suppose this harmonization has been arbitrarily imposed to carry out any preconceived theory; it has come about, as I shall show, as a matter of necessity.

When I played these songs upon an instrument to Indians who had learned to hear the tones of an organ or a piano, in the manner I have already described, the aria, as they sang it, when played as an unsupported solo, did not satisfy them. The song was pronounced correct, but it did not satisfy them. I could not divine the reason, nor could the Indians help me. I was greatly puzzled, and worked on the matter for a long time. Many of the songs I had noted were chorals or choruses to be sung by many persons, men and women together, in unison. When I was playing them by myself, I instinctively added chords, almost unconsciously; the chords gave the color which the melody alone lacked, to my ears, when I tried to recall the song as I heard it. I attached no significance to the satisfaction I felt in the supported arias, but attributed it to the demands of my own musical training. I cannot now be positive whether it was by accident, or whether I purposely played a song with chords to some of my Indian friends; my astonishment at the result has obliterated the memory of just how it came about. The Indians exclaimed: "Why haven't you played the song that way before; now it sounds natural?" The men had no idea what I had done, only that the song had become satisfactory. I have repeated these experiments hundreds of times, and always with the same result. I mentioned this fact to Prof. Fillmore, and he has made hundreds of similar experiments. This discovery, so simple and natural from one point of view, so unexpected and almost incomprehensible from all previous ideas of Indian music, has led to important results. Under the technical knowledge and the genius of Prof. John Comfort Fillmore has been demonstrated the reason why the Indians require this method of presenting their songs, demonstrated from the structure of the songs themselves. The songs as published satisfy the Indians; not one or two of them, but all the best singers of the tribe; no other method would content them, for in no other form did the songs sound natural to them when played upon an instrument. The insistence of the Indian upon this method of presentation as the only correct one, has resulted in the unfolding to us with singular clearness, the intent of the Indian singer, and has also shown us in an unmistakable manner, exactly how the song is built.

This manner of presenting Indian songs is no invention either of Prof. Fillmore or myself, and exhibits a striking fact in the history of Music and in the study of man; a fact that is far reaching in its influence.

It is impossible to display these songs before any audience; they must be carefully studied to understand their structure. The upper line of notes is the aria as sung by an individual; the harmony in no way affects this aria. Many of the songs embody in successive notes the chords that in the harmonization are struck simultaneously on



the instrument, indicating that these chords are fundamental in the structure of the song, and that the Indian is, so to speak, unconsciously conscious of them, that the chords are in some way present to him when he sings in succession their component notes; the only way harmonization could be attempted with the voice alone. It must never for one moment be forgotten that there is not a chord published in the monograph that has not been subject to Indian criticism and direction. Many of these criticisms have led to startling disclosures of Indian feeling in music; for instance, the preference for a major chord at the close of a minor song. Any scholarly musician who will study the harmonies of these songs will discern that there is not a chord used which is not implied in the structure of the songs themselves. I regret it is impossible for me to give at this time a full exploitation of these remarkable musical products of the untrained Indian; that would require us all to be technically expert musicians. I must refer any inquiring musical specialist to the monograph.

A large number of these songs lie along the line of the pentatonic scale, one of the simplest known. It is composed of a succession of tones within the octave, having the fourth and the seventh omitted, giving the first, third and fifth the tonic chord, the second and sixth being by-tones. This scale might be called the "natural scale" if universal usage could bestow the name; it is found among all peoples whose music has been observed; it is the scale in which the folk sing in China, India, Russia, Africa, all over Europe and in America. It is "major or minor as you change the centre of gravity," to quote Prof. Fillmore's apt phrase. The wide distribution of this scale, and its existence alongside of highly artificial schools of music, would seem to prove it to be the natural scale of unsophisticated musical expression, to be accounted for by the operations of the laws of acoustics and the structure of the human ear. Omaha songs, however, present examples of much more complicated scales, and many are not translatable into any known scales. All, however, are amenable to the laws which underlie and govern harmony, and all become intelligible when interpreted by these laws.

The notion formerly prevailed that there were people to be found who spoke a language that has a jargon. Philological research has dispelled this conception of human speech, and we now know that wherever man speaks his language has a structure more or less elaborate. The facts are now before us to prove that what is true of man's words is also true of his music; that, too, is no random utterance, but has its structure as definite as that of language; harmony being to Music what Grammar is to speech.

Language is intellectual; the tool of the mind primarily, to speak broadly; and the languages of the earth represent many and various forms of structure. If a more universally common structure prevails in vocal folk-music, may not the reason be that the emotions of the heart of man have more in common the world over than his intellectual ideas; these separate, while the former unite the human race.

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PRIMITIVE INDUSTRY.

THOMAS WILSON, LL.D.

AS time progressed man made certain improvements or inventions and attained a higher culture. These epochs have been differently divided and differently named; by some they have been called the cavern period; by others the reindeer period; and M. de Mortillet made finer distinctions to which he gave the names of localities in which the implements occur: Solutre, Moustier and Madaleine. These were caverns or rock shelters, and they all represent the cavern period, with the mammoth and the reindeer the most abundant, as the representative animals. The flint implements of these epochs were changed in some degree—the points become smaller; scrapers appeared; bone, horn, ivory was used; harpoons and fish spears are found along the river banks, and there have been already discovered about 400 specimens of engraved animal bones, some of which are only ornaments, while others are decorated implements, daggers, poignards, etc. It is coming to be fashionable in the United States to deny the authenticity of these works of Palæolithic art; to denounce them as frauds, declaring them to be too fine to have been the work of a savage. It is not my purpose on this occasion to enter into any defense thereof. Whenever these charges shall take proper form and appear over responsible signatures in the scientific publications of this country, and be transmitted to France and England, their people, who are most interested and best acquainted with these objects, will be abundantly able to make response thereto. Until that time, they will as I do—ignore all insinuations.

It has been announced that new discoveries made by some of our local archæologists, whose names were mentioned, had about demolished the Palæolithic age in Europe as well as in America. I dissent from this opinion, but it is not to be discussed here. When the proposition shall have been published, so that we may know exactly what is charged and what is to be combated, then it can be turned over to the European pre-historic experts for them to defend their proposition, and no one will doubt their ability to do so. The seeker after knowledge may properly ask, how it can be known that these different stages of culture succeeded one another in the order named, and why they should be classed with the Palæolithic age? I can only, upon this occasion, state the facts which appeared satisfactory to the various investigators, without attempting to argue or prove them. In the Alluvial period, the Chellean epoch, these implements have been found in various parts of Europe by the ten thousand, and always without the slightest trace of the association with implements of polished stone. A single locality, it is agreed, would be

little or no value, but when it comes to be repeated by the scores of times in localities widely separated, belonging even to different countries, with never an exception, it has been admitted as satisfactory evidence that there was a Palæolithic age independent from the Neolithic. That it was earlier than the Neolithic seems to be established. The position in which the implements have been found, indicating their great age; the conditions under which they have been found, deep in the undisturbed gravels of the river valleys, and associated with the bones of extinct animals, which, in the opinion of the investigating geologists, proves that they belonged to a prior geologic period, the Quaternary, or Post-pliocene.

The progressive steps of culture and invention mentioned as belonging to the cavern period, seem to have been satisfactorily established by investigation made in the caverns themselves, where, in numerous instances, the gradual filling up of the cavern has preserved the earlier occupation at the bottom, while the subsequent occupations have taken their respective places, each one above the other in their orders of time. For example, at Kent's Cavern, near Torquay, England, the caverns investigated with all possible care during a period of twelve or thirteen years, in which as many thousand dollars were expended, under the direction of a committee appointed by the British Association, where the strata of these early occupations were covered by layers of stalagmite spread over what was then the entire surface, separating and sealing it hermetically from subsequent occupation. Under it, in various parts of the cavern, were found these same chipped implements, which have been denominated chellean, and beyond the chips and flakes possibly the hammers, incident necessary for their fabrication. No other trace of human industry was found. In the Grotte de Placard, in southwestern France, the same super-position was found, which gave satisfactory evidence of this succession of human occupation and of the accompanying changes and improvements of human culture. The strata containing Neolithic and Palæolithic objects are distinctly marked, and are separated by a stratum entirely sterile so far as concerns Archaeology, made up chiefly of broken stones from the roof of the cavern, several inches in thickness. The cavern of Laugerie-Haute gives the same evidence, and is even more positive, for the sterile stratum is about four feet three inches in thickness. In the Grotte de la Vache the stalagmitic stratum between the Palæolithic and Neolithic industries is about eighteen inches thick. The latest indications we have occurred in the summer of 1892, when M. Boule was called from Paris to visit the pre-historic station cavern of Schweizersbild, near Schaffhausen, in the immediate neighborhood of the cavern of Thayingen, Thuringen, which gave the celebrated drawing, engraved on bone, of the reindeer browsing. M. Boule has just published a report of his investigations in the *Nouvelles Archives des Missions*, tome III, and he shows (pl. 3) the drawing which he has made of the débris left on the side of the cavern, showing the superposed and consequently successive occupations and corresponding improvements in human invention and human culture.

The difference between the Palæolithic and the Neolithic ages in Europe, the only place where it has been studied, are marked by differences in climate, geography, fauna, domesticity of animals, sociology and other things besides industry. Prof. Boyd Dawkins, "Early Man in Britain," page 265, says:

"The great changes in the fauna and geography of Great Britain, at the close of the Pleistocene age, rendered it very improbable that the cave-men were in any way represented by the Neolithic tribes who are the first to appear in pre-historic Europe. The former possessed no domestic animals, just as the latter are not known to have been acquainted with any of the extinct species, with the exception of the Irish Elk. The former lived as hunters, unaided by the dog, in Britain, while it was part of the continent; the latter appear as farmers and herdsmen after it became an island. Their states of culture were wholly different. We might expect on *a priori* grounds that there would be an overlap, and that the former would have been absorbed into the mass of the new-comers. There is, however, no evidence of this. . . .

"From the facts at present before us, we may conclude that they belong to two races of men, living in Europe in successive times, and separated from each other by an interval sufficiently great to allow of the above-mentioned changes taking place in the physical conditions of Britain." . . .

Sir John Evans, in "Ancient Stone Implements of Great Britain," page 618, says:

"There appears in Britain to have been a complete gap between the river drift and surface stone periods (that is to say, the Palæolithic and Neolithic periods); so far as any intermediate forms of implements are concerned; and here at least, the race of men who fabricated the latest of the Palæolithic implements may have, and in all probability had, disappeared at an epoch remote from that when the country was again occupied by those who not only chipped out but polished their flint tools, and who were, moreover, associated with a mammalian fauna far nearer resembling that of the present day than that of the Quaternary times."

M. Gabriel de Mortillet, in "Le Préhistorique," page 479, discussing the difference between the Palæolithic and Neolithic periods, says, the former belonged to the Quaternary geologic period, while the latter belongs to the present or actual periods. "Between these two epochs there are differences everywhere; there exists a veritable revolution." And he puts these differences, one against the other, in the form of a table.

In the latter epoch of the Palæolithic period the climate was cold and dry with extreme temperatures; while in the Neolithic period the climate was temperate and uniform.

In the Palæolithic period were living many great fossil animals like the cave-bear, the giant beaver, and, most plentiful of all, the mammoth; in the Neolithic period all these were extinct. Out of 48 well-ascertained species living in the Palæolithic period in France and England, only 31 were continued in the Neolithic period.



Of the animals living in the center of Europe on the plains, and associated with man in the Palæolithic period, no less than eighteen were cold-loving. In the Neolithic period, thirteen of them, such as the reindeer, antelope, musk ox, blue fox and white bear, emigrated to cold countries by latitude; while five, the chamois, marmot, wild goat and others have emigrated to cold countries by altitude, going up the mountains.

In the Palæolithic period there were no domestic animals. In the Neolithic period they were abundant.

In the Palæolithic period, the population was nomadic; they were hunters and fishers, but not agriculturists. In the Neolithic period the population was sedentary, and agriculture was well developed.

In the Palæolithic period there was practically no pottery in France and England; in Belgium there have been two localities where pottery has been found.

In the Palæolithic period there were no monuments of burials, and apparently no respect for the dead. In the Neolithic period there were many and great monuments, dolmens and menhirs of great size, with elaborate burials.

There is in the Palæolithic period nothing to show that man had any idea of religion or a future state; in the Neolithic period these sentiments and ideas were well developed.

In the Palæolithic period man has an artistic sentiment; in the Neolithic period he apparently had none.

So it appears that the revolution and contrast between the two periods is at once physical and industrial, natural and social. The changes in climate suggest changes of equal importance in orography and geography which must have been accompanied by profound geologic modification. All these changes in man's civilization, his surroundings and environments, took place between the Palæolithic and the Neolithic periods, and this in addition to the marked change in his industry from chipped to polished stone. Thus it will be seen that the latter difference is but slight, and only one out of a dozen which equalled if it did not exceed it in importance and effect.

Sir John Evans, in "Ancient Stone Implements of Great Britain," page 618, says:

"The antiquity, then, that must be assigned to the implements in the highest beds of river drift may be represented (1) by the period requisite for the excavation of the valleys to their present depth; plus (2) the period necessary for the dying out and immigration of a large part of the quaternary or post-glacial fauna, and the coming on of the pre-historic; plus (3) the polished stone period; plus (4) the bronze, iron and historic periods, which three latter in this country occupy a space of probably not less than three thousand years. A single equation involving so many unknown quantities is, as already observed, not susceptible of solution."

THE PALÆOLITHIC AGE IN THE UNITED STATES.—There have been found in the Trenton gravels, numbers of rudely chipped implements of argillite which have been called Palæolithic. They were

originally discovered by Dr. Abbott, who resided at Trenton, and who has been interested in pre-historic archæology, and was employed by the Peabody Museum, and who for many years has been devoted to the pursuit of evidence of early man in the Delaware Valley.

Dr. Abbott, like M. Boucher de Perthes, was subjected to much investigation, and had to stand under the light of fierce criticism from the opponents of his theory. Dr. Abbott's character or ability as an archæologist, a naturalist or an observer, is not at issue at the present moment. No person can now deny the fact that he believes that he has found a number of these implements deeply imbedded in the original gravel deposit of the Delaware River at Trenton. The implements found at Trenton and otherwheres in the United States have the same general appearance as those heretofore shown from other parts of the world. In addition to the mass of testimony on this subject, there may be added the testimony of M. Boule, a noted French geologist and student of pre-historic man, in the last number of *Anthropologie*, Vol. 4, pp. 36, 37 :

"During my voyage in the United States in 1891, on the occasion of the International Congress of Geology, at Washington, I was able to see some of the chipped stones of Trenton, in the collection of pre-historic archæology at the Smithsonian Institution, and in the Peabody Museum. I could there study at leisure the collections of Dr. Abbott. That which struck me most forcibly was the similitude, I may say almost identity, of the form of the American instruments with the European palæolithic implement. At Trenton, as at Amiens, Paris, in the collections of Dr. Abbott, as of those of M. d'Acy, there is, along with a certain number of chips and unformed pieces, also a number of finished pieces showing careful work, and which could not be 'rejects' of fabrication. The most careful and most competent archæologist of our country will be unable to distinguish otherwise than by the nature of the material the difference between the instruments of Trenton (as well as other parts of the United States) from the pre-historic implements of Europe. There is, in this fact, an argument in favor of the antiquity of these specimens which will impress pre-historic archæologists of experience."

The fact that other gentlemen entitled to equal credit for accuracy as observers have sought at Trenton for these implements in 1893 and failed to find any, is no evidence that Dr. Abbott may not have found them there from 1876 to 1890. The river gravels at Trenton spreads over and fills up a saucer-like depression about three miles in diameter, and from 35 to 42 feet in depth in the center. That these gentlemen should have sought with all care and closeness the gravels in the great sewer which has been lately laid through the city of Trenton near the river, and have found none of these implements, is no evidence that Dr. Abbott may not have found them among the acres of gravels ten to thirty or more feet in thickness that have been dug out, during a period of ten or fifteen years past, a mile away from the aforesaid sewer by the Pennsylvania Railroad, to obtain gravel for its road ballast.

Illustrative of my proposition, I may cite the depot of Chelles, near Paris, where hundreds of these implements have been found. It is an immense gravel bank, much the same as at Trenton, twenty or thirty feet thick, extending over an area of a hundred or more acres in the valley of the river Marne. It is located on a railroad, and as the gravel at Trenton has been dug out and transported as railroad ballast, I visited this station on the excursion of the International Pre-historic Congress at Paris in 1889, and there listened to an acrimonious discussion as to the precise locality in which the respective kinds of implements had been found, as, for example, what kinds were found at the top, and what kind at the bottom of the deposit; and it was there made apparent that, notwithstanding the thousand implements obtained from that depot, the principal disputants, the leaders of opposing schools, those who had devoted their utmost time, care and attention to the investigation of these implements and the theory of antiquity and civilization to be based thereon, none of them had ever found these implements in place. M. Boule, himself a close observer, and an ardent investigator, interested in this branch of study, gives his opinion as to the want of value in the objection made that other persons than Dr. Abbott have not found these implements when they sought them in the Trenton gravels. M. Boule says, in the last number of *l'Anthropologie*, Vol. 4, p. 38, in reporting his visit to the United States during the last international geologic congress:

"I did not myself find any of these chipped stone implements during my excursion to the gravel pit at Trenton, but there is a similar locality in the neighborhood of Paris, very rich in implements—in Chelles, for example—where I have been many times, and my searches have always been infructuous; but the deposit of gravel presents entirely the same topographic and stratigraphic disposition of the palæolithic alluvium of the north of France and south of England."

This proposition will be better understood when the conditions are once explained. The depot at Chelles is in the neighborhood of 100 acres area, 44,000 square feet to an acre, 100 times that to 100 acres in surface measure. If the gravel bank be twenty feet deep, it would be twenty times that number, 88,000,000 cubic feet of gravel. I have said 1,000 implements; there may have been 10,000 such implements found at Chelles, which, scattered among 88,000,000 cubic feet of gravel, will give an average of one implement to every 8,800 cubic feet of gravel. Sometimes they are bunched, so that one may find a dozen in a single pocket, or a hundred in a single day, but this only decreases the chances of finding them within any specified time. This explains M. Boule's statement that a man may stay there and watch the diggers for a week without finding a single implement—this, too, in a gravel bank which may have furnished 10,000 implements. These figures are not pretended to be exact. They are only to serve as illustrations. There may not have been 100 acres, and it is only from remembrance of its appearance when its depth is estimated at twenty feet.



M. de Mortillet has made a similar estimate with regard to St. Acheul, that other depot of Palæolithic implements which has probably furnished a greater number than any other; and he has shown that the dissemination of the implements through these gravels rendered it very unlikely that a person could find an implement at any given locality or in any given length of time. On the other hand, Dr. Capitan discovered a deposit of palæolithic implements in south-western France during the summer of 1892, of which he said he found an implement or a bit of worked flint every five minutes. It was quite different from this in the workshop of Bois de Rocher in Brittany, discovered by MM. Micault and Fornier. That was a workshop, and the implements were found all together, and in a few days' excavation. Consider the number of these implements in the Chelles and St. Acheul gravel banks, and their comparative scarcity in the gravel deposits at Trenton will not appear strange, nor will the fact that gentlemen spend weeks or even months in the search through these gravels in what proved a vain attempt to find Palæolithic implements, be evidence against their existence. Imagine the gravel bank adjoining the Pennsylvania Railroad depot at Trenton, extending by estimate eastward half a mile, a quarter of a mile in width, the gravel twenty or more feet in depth, dug down and thrown into cars upon temporary tracks, which are moved each day or each week close into the bank—imagine, I say, this great mass of gravel, amounting to millions of cubic feet, with the number of Palæolithic implements said to have been found by Dr. Abbott, I care not whether we take the smallest number, 40, or the largest number, 400 or 500, scatter them through this pile of gravel, and then consider what would be the chance of a person finding one of these, I care not what his ability as an observer, how ubiquitous he was, nor with what attention and zeal he followed the shovel of the diggers and inspected the fine gravel they threw out. I only repeat the sole conclusion intended by this line of argument—that it is no proof these implements do not exist in these gravels that other gentlemen have sought for and failed to find them; while Dr. Abbott, who has lived in the neighborhood all his life, has been engaged in the search for twenty years or more, has invoked the aid and enlisted the co-operation of his neighbors, the diggers, and the public in general, and during all that time has found only the number suggested, I care not whether it be 40 or 400. No attempt has been made by anyone to impeach the veracity of Dr. Abbot in this matter. We must accept his statement as to the fact of his finding of these implements. The conclusions to be drawn from his facts are fair subjects for argument, and not pretended, it is because we must accept Dr. Abbott's facts, that we must necessarily adopt his conclusions.

It may be said that in this matter Dr. Abbott has been deceived; that the implements to which he has attributed this antiquity have been fabricated, imposed upon him as genuine, when they might have been made by the workmen with intent to deceive. This has occurred in other places. M. Boucher de Perthes himself was sadly deceived in several cases. One proof of the antiquity of stone imple-



ments, or of some of them, is by the *patina* or weathering shown on the exposed surface. Any of the argillite implements from the Trenton gravels may be broken, and thus show the difference of color between the inside and the outside. On the outside it is a dull gray, on the inside it is a shining black; the black color is the natural appearance of the stone; this is shown when first chipped; the gray appearance is from the weathering, and it has been made by long exposure.

Evidences of the primitive industry of man have been found in many other places of the United States besides Trenton. At Loveland and Madison, Ohio, by Dr. Metz; at Newcomerstown, Ohio, by Mr. Mills; at Fedora, Ind., by Dr. Cresson, and at Little Falls, Minn., by Miss Babbitt. All of these localities have been attacked in late publications by disbelievers in the existence of Palæolithic Man. In order that I may be fair in argument, and accept fully the facts according as they are found by the observer, it must be conceded that the evidence of palæolithic occupation at Little Falls has been successfully assailed by the investigations of last summer made there by Mr. Holmes. I have upon another occasion complimented Mr. Holmes upon the system and thoroughness of his investigations there; and his conclusions, so far as they are based upon those investigations, must stand until some subsequent investigator, going over the same ground, shall change the facts. I may have disagreed with Mr. Holmes in his conclusions, but I concede his facts must stand.

Some years ago I made an appeal in the form of a circular from the Smithsonian Institution, asking for information, which was scattered throughout the United States, concerning these objects, and I accompanied this with cuts and engravings of similar objects, some from Europe and others from America. I received responses from nearly every State in the United States, and many States responded with great numbers. I do not propose to follow the result of this investigation in all its details, but to say that there was reported to the Smithsonian Institution a large number of implements similar in every regard to those found in the gravels at Trenton and other places, and to those from Western Europe. Many of those reported were not Palæolithic—did not resemble Palæolithic implements—many of them were but chips and rude flakes—some objects were manifestly Neolithic; but omit all these, still there was a considerable number of implements, representing practically every State in the United States, which would correspond in every particular (save in some cases material) with those from Europe. These identical implements, had they been found in western Europe, and presented before any committee of the best archaeologists, they would be pronounced Palæolithic. In this connection, I refer again to the quotation made a little time ago from M. Boule, wherein he states the same thing. But these implements were not found in Europe, and their value as evidence of Pre-historic Man in the United States has been disputed.

You will ask what is my conclusion with regard to this matter. I conclude that this similarity of such vast numbers of these imple-

ments from two continents and representing widely separated peoples is, as M. Boule has said "an argument in favor of their antiquity which will greatly impress pre-historic archæologists of experience." It is to be taken as serious evidence in favor of Palæolithic Man in America, as it has proved him to have existed in Europe. But it is only a single step in the ladder of pre-historic science, and is to be treated more as a working hypothesis calculated to direct attention and stimulate investigation. My conclusion is not announced dogmatically, nor will it be defended at all hazards. It is expressed under all reserve, and subject to future discoveries. It will have served a good purpose if it shall promote the search of the river valleys for these implements, will cause them to be gathered and saved as of value to science; to note well their associations with other subjects to be noted, and to discover their material, and, if possible, the original deposit and the place of their fabrication. By these means we may hope to arrive at the truth concerning these implements and their relation to Pre-historic Man.

## SUGGESTIONS THAT MAY AID IN THE INTERPRETATION OF THE MAYA HIEROGLYPHS.

HILBORNE T. CRESSON, M. D.

### PART II.

(*Conclusion.*)

THE name of the month sign, *yax*, is repeated by the wing element, which in this case represents y or i ( $y = i$  in Maya); the *canac* glyph near it gives ca (v-s), from which ac is obtained, giving *yak* or *yach* ( $k = c$  in Maya); there is reason to think that *canac* was spelt *chanac*, and its phonetic value in that case would be cha (v-s), from which ach is obtained). The pot glyph above is a phonetic addition, and suggests the hissing sound of x, sh or ch (soft) in the month name *yach* or *yax*.

In the month sign of Landa *keh* or *ceh* ( $c = k$  in Maya), the wing element (*yax* = a wing in Maya) appears with the consonant value of h.

In the month sign *Xul* the wing represents the consonant value of x. The glyph to which it is attached is the representation of a vulture's head = *kux* or *kuch*, from which by vowel fluctuation (marked (v-s), this being suggested for future use by those interested in Maya paleography), *uch* or *ux* is obtained. The l element does not appear in *xul*, unless it be the curved enclosing line of the glyph, which is not unlike the l curve (see the so-called "Money Glyph" of the Bee Keeper's Narrative, leodex Troano, plates 1 to 16); here the l curve is joined to a black dot and shown to perfection. The twisted line

*ban* is also well shown in this glyph; see, also, day sign *caban*, and its variants in the codices. I fail to find that the wing element has the phonetic value of *il* or *l* in the codices. If it be suggested that it does in the sign of orientation for east, I reply that the sign for east repeats by its component parts *kin-ich-ahau* or *kin-ich-ahaulil*, literally "Sun-eye lord," the name of the sun god *Zamná*, who arose in the east to give light to the world. *Kin-ich-ahau* or *Zamná*, there is little doubt, was intimately connected with sun worship and the light myths.

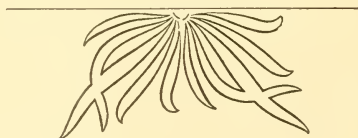
Examples might be multiplied to show that the Maya scribe seems to have given certain elements phonetic values derived from a word, and consonants of that word. In the wing glyph *yash* attached to the month signs that have been considered *yash*, *y* and *x* (or *sh*), and *h* show the truth of the suggestions made.

What I deem to be the vowel elements used in the Maya graphic system are shown in figs. 3 to 7 of the plate accompanying this article. The circle enclosing a smaller circle (fig. 3) = the *á* vowel probably derived from an ideograph of a drop of water (*haá* = water in Maya); fig. 7, also = *i*; fig. 6 is probably allied to fig. 3 and = *á*. The *i* vowel element (fig. 7) seems to be used, at times, twice repeated to represent the eye = *ich* or *uich*; see fig. 26; it also recalls *ca* = "two." The two open circles shown in fig. 9 seem to be used in a like sense to fig. 8 in recalling *uich* or *ca*; see fig. 34. Figures 10 to 12 show the small count squares mentioned by Perez (see Brinton, "The Maya Chronicles," pp. 47, 48), in his extracts from various Yucatecan manuscripts (Codex Perez). The count squares, together with figs. 13 to 16, are similar in shape to the *a e* vowel, fig. 4; they frequently appear as minor elements in the Maya glyphs, and seem to be used in some cases as phonetic additions. A good example may be seen in three *canac* (or *chanach*) glyphs given on plate 23 of the Codex Peresianus, where these three glyphs seem to recall the name *Xul-chu-kan*. The small phonetic addition attached to two of these glyphs change their phonetic values to *xu* and *ku*. In the Codex Cortesianus, just above the figure of *huncimil*, plate 16, the small squares are attached to the month lines of certain of the face glyphs; they are evidently used as phonetic additions, and make changes in the value of some of the phonetic elements used in the composition of the glyphs. At first sight some of the glyphs appear like repetitions of the same glyph, but the phonetic additions make changes in the value of the phonetic elements used in the composition of the glyphs.

The position of certain elements is to be remarked in the glyphs, whether they be used as single elements or combined with other elements as the composites of simple glyphs, compound glyphs, or of face glyphs. The elements that occupy the perpendicular and parallel positions seem to have a tendency to *á* sounds. In the curved and oblique positions to *an* sounds (the parallel position shown in the plate should be *ka* instead of *i*, *o*, *u*, and the oblique *an* instead of *e*, *a*), the reversed positions of glyphs ought to be studied; for instance, the glyph *ahau* or *ahaulil* (fig. 34), whose phonetic value is *ah*, *ha*

(v-s), seems to have, when reversed (fig. 33), the phonetic value of la or al. The glyph, fig. 55, in some cases seems to be cha or ka. In fig. 54 it has the same value. Placed in the oblique position it would have the value of chan. I have not had sufficient opportunity to test fully the positions occupied by glyphs and certain elements, whether it assists in determining their phonetic value. There seems to be tendency in that direction, and it would be well to bear it in mind.

Outlines, enclosing glyphs, are more or less ideographic. They take the forms shown between figs. 17 and 21. It will be remarked that they closely resemble the vowel elements. The outlines shown in figs. 22, 23, 24, 25 are generally used as prefixes or suffixes. They are closely allied to *kan*, ka (v-s), an sounds, the an element being generally placed inside. The motive is evidently derived from the life line of the serpent. The outline given in figs. 17 and 18 are allied to a, e sounds, and figs. 19 and 20 to i, o, n sounds (o = u in Maya); some of these outlines are enclosed inside of others in fig. 43. One can hardly doubt in looking at the outline of the day sign, *manik* or *manich*, fig. 46, that it is an ideographic suggestion of a pinching hand intended to aid the reader in obtaining the syllable ich. To pinch, in Maya = *ch'i*, and reversing the vowel position, placing it at the other side, *ich* is obtained. In other words, the vowels are fluctuating, and on my list of phonetic values assigned certain elements, to be used in interpretation (Science, No. 451, Vol. 2, p. 325). I have given this element that of *chi* (v-s); the (v-s), as I have explained, calls attention to this fact. If the day sign *manich* or *manik* be examined, a phonetic addition appears containing the á vowel combined with two small elongated squares, also associated with *ká* and *á* sounds. The syllable *ak* is evidently indicated, and I am inclined to think that the name of this day sign was originally *manach* or *manak*, or else the scribe desires to call especial attention to the á vowel by repeating *ak*. The outlines enclosing the minor phonetic elements of the glyphs are evidently not devoid of ideographic, even phonetic value, for the scribe seems to arrange them in keeping with the idea he wishes to convey to the reader, writing not by the thing represented but by the sound of the name of that thing.





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## EDITORIAL.

THE Ohio Archæological and Historical Society was organized in 1885. Since that date it has steadily progressed until at present it includes in its membership the most intelligent and influential citizens of the State. Himp-ered by meagre appropriations its work has been somewhat retarded and limited. A lack of appreciation of archæology as a *science* (as it is viewed by the eastern societies) has also conspired to retard the progress of the Society. Yet, in spite of all these and other difficulties, the organization has done a most creditable work. Foremost among its achievements stands the purchase and preser-

vation of Fort Ancient. This famous earthwork was brought before the Ohio Legislature through the medium of Senator Orin, of Warren county, who introduced a bill providing for its preservation as a State park. The bill passed, the earthwork was bought, and it is now assured to future generations. Surely no more praiseworthy expenditure of State funds could have been made.

Fort Ancient stands first among the pre-historic enclosures of the United States. It is not excelled either in magnitude or in interest, yet there are some three thousand pre-Columbian fortifications in the country. The scheme of the Society to make of it a natural park but slightly improved and beautified, is a most commendable one. Care should be exercised, however, that it be not altered or changed in any particular. Properly conducted, the explorations which the Society has in mind, will be of great importance.

The several village sites, the mounds, the ditches and the pavements within the walls of Fort Ancient all yield fruitful fields and facts for exploration. While the great generalities regarding the life of its builders have been ascertained, there are many details yet to be worked out. The solution of these lies with the archæologists of the Society. While the presentation of the structure as a park is of paramount importance, we must realize the importance of new facts to be obtained; facts which may be had after small explorations. In the examination of the inclosure we must steer clear of all that is un-scientific—of that which smacks of the charlatan.

The society is to be congratulated upon its acquisition of Fort Ancient. Great opportunities are given it, may those advantages not be neglected.

Throughout the State are many pre-historic remains over which the Society should exercise control. First among these stands the alligator effigy at Granville. It could be purchased for a small sum. Since the combined efforts of all intelligent citizens are necessary in the work essayed by the Society, we trust that all Ohio collectors into whose hands this number of the *ARCHÆOLOGIST* may fall will send their names to the Secretary, Mr. E. O. Randall, 35½ N. High Street, Columbus, Ohio, who will send prospectus of the Society publications to all interested persons. The reports are full of good historic and archæologic matter.

NOTE—Aside from the collection in Archæology (and the Society has a large and valuable one), the maps, papers and letters of historic interest constitute a large part of its cabinet.

In the next three numbers of the *ARCHÆOLOGIST*, articles will appear by Messrs. Henry Haynes, McGee, Nadaillac, Fowke, Harper, Smith, Fewkes, Soney, Remsburg, Howe, Winslow, Saville, Laubach, etc. The continued articles and the discussion of Palæolithic Man will be chief features. All papers, however critical, are invited. Three well known Washington, Boston and New York museum assistants will send notes upon field work, new collections, etc. The *ARCHÆOLOGIST* will present papers to its readers during the fall and winter,

unsurpassed in importance and interest by any anthropologic journal in America.

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### BOOK REVIEWS.

Report of the International Congress of Anthropologists held at Chicago, August, 1893. C. S. Wake, editor. (Reviewed in next number.)

The Sacred Symbols and Numbers of Aboriginal America in Ancient and Modern Times, by Francis Parry, F. R., *Bulletin of the American Geographical Society*, No. 2, 1894.

"Summary—The Origin of Sacred Numbers; The Foliated Cross a Memorial to Maize; The Deification of Corn; Sun and Death Masks; The Symbolism of the Serpent Mound; The Hand Signs of the Colossal Statues."

"The progress of research has been to set aside as of secondary value much that was written regarding the aboriginal faiths of America by the explorers of the ruined temples of the central region early in the century." The author says that the early writers were anxious to establish a relationship between Central American peoples and those of the East, prior to the Christian era. He well contrasts the work of the old and the new schools of archæology—the former with fixed theories to uphold, often contorting testimony to uphold preconceived hypotheses, the latter recording "with accuracy everything regarding the ancient peoples, whether great or minute, so long as it is within the limits of this country; and historic, semi-historic and pre-historic sources are contributing to the general fund of information."

The book, while somewhat beyond the depth of the average student, will be found to be of great value to the archæologist, and of especial interest to students of American religions, religious symbols, etc.

Crosses and characters of a symbolic or religious significance from the cliff houses of the southwest, from ruins in Mexico, Yucatan and Peru are carefully compared. Numerous illustrations accompany the text.

Professor Parry's work is along similar lines with Messrs. Brinton, Thomas, Cresson, Cushing, Fewkes and Le Plongeon. He pays a high tribute to Mrs. Nuttall, who is, without doubt, the greatest authority upon Mexican antiquities.

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"Notes on Ohio Archæology," by Gerard Fowke; 6 figures; 11 plates; 60 pages, 75c. A. C. Gruhlke, Waterloo, Ind.

Mr. Fowke always approaches his subject directly. His observations give forth no uncertain sound. Those of us who know his work and compare it with that of others can truthfully affirm that no other man among the archæologists has the practical knowledge which he possesses of Ohio's primitive tribes. Mr. Fowke is not so well known as others. He has been content to work quietly along; to explore and survey. He has not rushed into print half prepared; he has abided his time until now. His book bears unmistakable evidence of great thought and careful preparation. It embodies not only his own observations, but those of several of the best archæologists who have been in the Ohio field.

There are numerous works descriptive of the remains in the State. Nearly all are misleading. Most of them cater to the love of the ignorant, and gaily picture the high civilization of the Ohio tribes.

One of the aims of Mr. Fowke's book is to set aside these popular errors; we can best show how he has fulfilled his mission by quoting several paragraphs from the work:

"In our own country the expression 'Mound builder' has been appropriated as distinctive term for a people supposed to have preceded the modern Indians, and to have differed from them in almost every respect; and was made to embrace the authors of not only the remains in the Ohio Valley, but all cognate works in the United States. Methodical investigation has broken up this mythical 'nation' into separate tribes, whose relationship to one another, if, indeed, there be any, is very obscure."

"An argument in favor of the unity of mound-building people and their entire disconnection from the modern Indian, has been the supposed lack of knowledge on the part of the latter concerning these works. The error of this assumption is shown, as specified above, by numerous cases of comparatively recent construction. The Indians found in the Ohio Valley by the whites, having been in the region only three or four generations, no doubt came long after the departure of the Mound Builders; they could know nothing of them merely from having lived among their remains, and if any vague record had been handed down from a former age of possible contact, its connection with unaccustomed features in a strange country would probably not have been noticed."

He refers to the Delaware tradition of the Tallegwi (Brinton's Walum Olam) and Snake People—probably the last of the Mound Builders.

Mr. Fowke does not believe that the facts warrant the assumption that there was, at any time, a dense population in the Ohio Valley, or that the tribes were advanced beyond the middle grade of barbaric culture.

"The amount of labor necessary for the construction of the Mound Builders' remains has been greatly exaggerated." He carefully figures the amount of earth in the average mound, earthwork and fortification. He concludes that one hundred men would build a mound 20 x 100 feet in 42 days. The average enclosure could be built by the same force in 546 days. One thousand men, each working ten days in the year and carrying three wagon loads of earth or stone in a day, could construct all the works of Ohio within a century."

As to errors in the marking of perfect circles and squares, he mentions one which has been frequently described as "perfect," which is really 748 x 866 feet. His section devoted to the relics used by Ohio tribes is quite complete and interesting.

Altogether, the book is so worthy that every student and collector should not fail to place a copy in his library.

## COLLECTOR'S DEPARTMENT.

## ✓ THE CASTRO MOUND.

Thirty-eight miles south of San Francisco, not far from the railroad, is situated an earthwork known as the Castro Mound. This immense pear-shaped mound lies in an open plain about three miles from San Francisco bay, it being one of four within a radius of four miles. It lies with its longer axis north and south, and measures 470 feet in length by 320 in breadth, having an area of nearly two acres. It varies in height from two to ten feet, there being a depression along the minor axis. The greatest height is reached at the north end where the declivity is the steepest.

The material used in the construction of the mound was originally the ordinary black adobe, similar to that found in the surrounding fields, but now rendered much lighter by the admixture of the ashes from many fires. It was evidently taken from the fields immediately surrounding the mound, the trench thus formed having become, in the process of time, a swamp, with its characteristic growth of long grasses and scrubby willows.

A few years ago a Portuguese while plowing the mound exhumed two skeletons, but being superstitious, he quickly re-interred them, and abandoned the work on the mound. Nothing more was done until, in the summer of 1893, a student of Stanford University observing the mound from the railroad determined to examine it. He dug up a few skeletons and relics, and nothing more was done until near the end of December, when a party of students and professors, under the direction of Prof. Mary Sheldon Barnes, undertook the exploration of the mound. Diligent inquiry among the

residents of the neighborhood brought forth a dim tradition that when the region was first visited by whites the mound marked the site of a flourishing Indian village. However, nothing has yet been discovered in the mound that would lead one to suppose that the builders ever had any dealings with civilized races.

The first systematic work on the mound was the digging of a trench, running east and west, a little north of the center, and about half way through the mound. This brought forth bits of bone, shells, pieces of flint, and many indications of fire.

On the western edge of the mound a hole was sunk revealing a valuable find. Lying on its right side upon a thick bed of ashes with its head towards the east, and the limbs drawn up close to the body, occupying the least possible space, with a mortar close to the limbs, was found the skeleton of a very old man. In life he had suffered from some disease which had left him strangely deformed. With the exception of the second joint in the neck there was a complete ossification of all the joints of the spinal column, making the whole very rigid. The ribs were firmly jointed to the spine, and at the points of attachment of the larger ligaments there were considerable deposits of osseous tissue, showing that the tendency to ossification had been general. The spine curved sharply forward from the first lumbar vertebra, making it impossible for the possessor to assume anything approaching an erect position, even denying him the power to raise his head. In life one of the bones of the left fore-arm had become fractured, but had been reset with great accuracy. Some of the bones of the feet bore traces of the action of fire. Resting



on the left shoulder was found a large clam shell. In another part of the mound I exhumed another skeleton, three vertebra of which had grown firmly together, causing a stoop in the back of the owner.

Another skeleton, that of a child, bore evidence that the owner had met a tragic death. Penetrating the skull to a depth of two inches was found a bone implement resembling a dagger. Out of over fifty skeletons thus far exhumed from the mound, the above is the only one which bore evidence that the owner had met an unnatural death.

The skeletons are interspersed about the edge of the mound at a depth ranging from one to six feet. As a rule, a skeleton is found lying on its back with the limbs drawn up close to the body, and the hands resting on the breast in the direction east and west, with the head facing the north. They are also found in various other positions, with the head facing in all directions and lying on either side. Some lie with their limbs extended at full length, north and south, with the head to the north, but no well authenticated instance has been found of the head of a skeleton lying towards the south. They lie in no special position with respect to one another, but are often found three deep. As a rule, above and below each skeleton is found a layer of charcoal, ashes and burned clay.

Many bones show traces of fire; the lower jaw-bone and a skull, in particular, of one skeleton being badly burned. Indications seem to point to the conclusion that when most of the bodies were buried they were laid on beds of coals and hot ashes, which burned away the flesh and charred the bones. Another evidence of this is that with many skeletons bone implements were found, which were either partly burned away or bear certain traces of fire.

A great many relics have been found associated with the skeletons. About many skeletons, extending along the spine, from the pelvis to the skull, are found hundreds of small shell-beads or wampum, which

were evidently strung on some fibrous material. Seven varieties have been found, all made of shell, some being no larger than one-eighth of an inch in diameter and one-twenty-fourth of an inch thick. They are of fine workmanship, being perfectly round, with a hole in the center made by drilling part way through on one side, and then completing the perforation from the other side.

On one skeleton was found four fragmentary arrow-heads, being a rare case, since only seven arrow points, all of obsidian, were found in exhuming over fifty skeletons. These must have been obtained by barter, as there is no obsidian in the neighborhood, the nearest locality being in Napa County, at least sixty miles distant. They were either unused to the working of obsidian, or else they obtained the relics already made from the inhabitants of Napa County who disposed of only their defective points. Stone relics are rare, only a few having been found, including the above mentioned arrow-points, three net sinkers, a few pestles and eight or ten mortars. The pestles were found both away from and in connection with skeletons, but seldom near mortars.

The builders of the mound had an odd way of disposing of their mortars which I have never seen mentioned in any work on Archæology. When any of them died and the body was laid in the grave, any ornaments which the owner might have possessed in life were placed upon the head, and a mortar placed over the whole, wrong side up, so that the hole of the mortar contained the head of the corpse. Out of five mortars discovered by myself, four were found as above, and the other one was resting right side up on the the breast of a skeleton, and was the only mortar which had a pestle near it. The hole in the mortar was no larger than a door knob, which may have accounted for the variation in the method of burial. Under one mortar was found fourteen little ornaments made out of saw-fish saws. The mortars were of

medium size, ranging from 10 to 200 pounds in weight, and most of them were spherical with flat bases.

The skull of one skeleton was found lying between two abalone shell dishes four inches in diameter, with the convex side of each shell in contact with one side of the skull.

Many abalone shell pendants and a few gorgets were found in contact with the skeletons; one skeleton having no less than twelve large circular pendants arranged in pairs along the body from the pelvis to the skull. Some of these pendants are greatly worm-eaten — an evidence of great age. The gorgets are of various shapes, but mostly rectangular. With one skeleton I found three of unusual type, two of which were circular, each having a sort of handle projecting from the edge, and the third being shaped like a skate's egg, having, besides, two holes entirely through it, six others drilled partly through one side. The only traces of ornamentation that they bear are little notches around the edges, which are common to nearly all pendants found in the mound.

Various bone implements were found, including awls, dagger-like implements, pointed instruments made out of the arm-bones of children, and six animal bones having notches cut along one edge, which were evidently used to indicate the number of deer and other game killed by the wearer. Various relics here found, including two bone musical instruments; bone tubes from two to five inches long; a pointed hair ornament made from one of the foot bones of a deer; and an agricultural implement made from an elk's horn. With a few skeletons, often on the breast near the neck, were found chunks of red and yellow ochre, which had evidently been prepared for paint.

Among the animal bones found in the mound have been identified those of the elk, deer, wolf, skunk, ground squirrel, salmon and various water fowl.

Throughout nearly the whole mound there are at least three layers of ashes and burned clay, and in some parts from four

to five. This is true especially at the center of the mound, where no skeletons have been found, but only the remains of fire, together with oyster, clam and mussel shells, and the claws of crabs. Living close to the water a great deal of the food supply came therefrom, but game and products of the soil were often obtained as shown—the one by their remains and the other by the tools by which they were prepared. They often split the bones of the larger mammals to extract the marrow, and sometimes buried whole birds beside a departed friend.

At the south end of the mound the skeletons are all of a brownish color and much decayed, and are buried with many relics; while at the north end they are yellow and in good condition, and have fewer relics about them; the relics at both ends are very similar. At the south end the skeletons are found at a depth of from one to three feet, while at the north end they are found at a depth of from two and one-half to six feet. The skeletons are of the same type, the skulls being all mesocephalic, showing a low grade of intelligence.

These observations lead to the conclusion that there were at least two great periods of burial of one and the same race which has passed away, leaving only a few mounds with their enclosed relics to attest to their previous existence. After diligent inquiry I can learn of no relics having been found in the fields adjoining these mounds; which seems to show that the majority of implements which they used were made of bone or shell, which having become lost or broken and cast aside, have returned to the dust from whence they came. Their makers were laid away with great care and ceremony, only to remain until the archæologist should say "come forth."

GEO. L. HOWE.

Brownsville, Oregon.



## INFORMATION FOR COLLECTORS.

*(Continued.)*

This able writer mentions three idol pipes which he saw in Georgia in the summer of 1859, and which were either carried away or destroyed by Federal soldiers during the invasion of the above State in 1864. Two of them were made of serpentine, and the other of mica-slate, and represented in each instance the human figure in a sitting position with drawn up knees, elbows resting on the knees, and the extended hands clasping an urn-shaped bowl. As the bowls rested upon the abdomen and lower part of the breast they disguised the sex. Not so with the idol pipe figured in THE ARCHÆOLOGIST. The bowl is here cut into the back of the human figure, and the sex of the idol is apparent. They do, however, all agree in the appearance of the countenance which is strongly idiotic. The supposition that the Cherokee Indians were the makers, not alone of the "mound" or "monitor" pipes first described, but also of the "idol pipes" which have just claimed our attention has been pretty clearly proven. Want of time and space prevents a discussion of this matter here.

Another very rare type of pipe are the specimens called "disc pipes"; so named because the bowl is a broad horizontal disc, several inches in diameter, resting on a rectangular base or stem which projects some distance beyond the bowl. In the writer's collection is a catlinite pipe of this type plowed up in a field in the vicinity of a mound near Elmira, Stark county, Illinois. This figured in Edwin A. Barber's article on "Catlinite" in the *American Naturalist*, Vol. xvii, p. 754. This writer says of it: "This pipe, which is carved from a single piece of stone, although not unique in form, may be considered a rare type." The bowl, which is much smaller than the orifice in the stem, was intended to hold but a small quantity of tobacco, mixed probably with other herbs having narcotic properties, the smoking and per-

haps inhalation of which produced a sensation akin to intoxication or exhilaration. Mr. Barber mentions four other pipes of similar form belonging to different cabinets, and all made of the same material.

Catlinite played an important part in the manufacture of pipes, and was undoubtedly used by the North American Indians for hundreds of years. The mineral was named after Mr. George Catlin, who was the first white man allowed by the Indians to visit the red pipe-stone quarry in 1836. It is situated in what is now Pipestone County, Minnesota. A vivid and interesting description of this excursion is given by Mr. Catlin in "Catlin's Indian Gallery," in Smithsonian Report for 1885, part 2, p. 240. It may interest my readers to quote from his musings while at the quarry: "Here (according to their traditions) happened the mysterious birth of the red pipe, which has blown its fumes of peace and war to the remotest corners of the continent; which has visited every warrior, and through its reddened stem the irrevocable oath of war and desolation. And here, also, the peace-breathing calumet was born and fringed with the eagle's quills, which has shed its thrilling fumes over the land and soothed the fury of the relentless savage.

"The Great Spirit at an ancient period, here called the Indian nations together, and standing on the precipice of the red pipe-stone rock, broke from its wall a piece, and made a huge pipe by turning it in his hand, which he smoked over them, and to the North, the South, the East and the West, and told them that this stone was red—that it was their flesh; that they must use it for their pipes of peace, that it belonged to them all, and that the war club and scalping knife must not be raised on its ground."

A curious legend obtained by Mr. Catlin while on the ground is: "That in the time of a great freshet, which took place many centuries ago and destroyed all the nations of the earth, all the tribes of the red men assembled on the Coteau des Prairies to



get out of the way of the waters. After they had all gathered here from all parts, the water continued to rise, until at length it covered them all in a mass, and their flesh was converted into red pipe-stone. Therefore it has always been considered neutral ground—it belonged to all tribes alike, and all were allowed to get it and smoke it together." And so was it always held. None met here but in peace, and enmity was, for the time being, forgotten. Numerous are also other forms of pipes made from this material, which embraces the "monitor," or "mound" pipe, in plain and animal designs, human, oval and other common forms.

Clay or terra cotta pipes from the size of thimble to those having a capacity of one and even two ounces, and of various and diversified designs have been found in abundance in every section. They, are, however, in a perfect condition, not numerous. This is easily accounted for. They used in the manufacture of these clay smoking utensils the same material as that from which their pottery was made, which appears to have been a mixture of sand, clay and broken or pounded shells. The pipe of this material was no doubt mostly used by the aborigine for smoking purposes. The human form was copied, often in a grotesque and obscene manner, and writes Col. C. C. Jones, p. 412 of his "Antiquities of the Southern Indians," the nude human figure in kneeling, bending or sitting posture, frequently formed the subject of imitation, and we have seen several pipes of this description which, in the language of Adair, could not "much be commended for their modesty." Quadrupeds, birds and reptiles, too, were imitated, and some remarkable specimens have been found. E. G. Squire, in his *Aboriginal Monuments of the State of New York*, p. 76, published in *Smithsonian Contributions to Knowledge*, tells us: "The most beautiful *terra cotta* which I found in the State, and which in point of accuracy and delicacy of finish, is unsurpassed by any similar

article which I have seen, of aboriginal origin, is the head of a fox \* \* \* \* which is composed of fine clay, slightly burned." This object is not a pipe, but the writer merely mentions it to show how artistically the Iroquois Indians who inhabited that part of New York State could work in clay. Most elaborate pipes from this material have been discovered, which proves that the Indian molded as artistically in clay as he sculptured in other and harder material.

Very seldom is a perfect clay pipe found in Eastern Pennsylvania or New Jersey. There is in the writer's collection a clay pipe of common form, *i. e.*, the bowl almost at right angles with the stem, which is broken. It was taken from a grave in the vicinity of Lebanon, Pa., and would have been destroyed had not the owner of the ground fortunately arrived at the spot and claimed it before it was taken away. Around the bowl, which holds about half an ounce of tobacco, are several incised circles and parallel lines. A few smaller circles are also cut on the face of the bowl, I cannot here describe clearly my pipes, because they are all on deposit under glass, in locked cases in the museum of Archæology belonging to the University of Pennsylvania at Philadelphia. When there in the first week of June to make examination of them, I failed to find the keeper of the keys; Mr. Mercer, the curator, being away in Virginia on an archæological tour. The writer can safely say that it is one of the finest and most interesting clay pipes yet found in this section.

Speaking of the great rarity of pipes in New Jersey, the same of which can also be said of Eastern Pennsylvania, Dr. C. C. Abbott writes in *Smithsonian Report* for 1875, p. 343: "The comparative rarity of aboriginal smoking pipes is easily explained by the fact that they were not discarded as were weapons, when those by whom they were fashioned entered upon the iron age. The advances of the whites in no way lessened the demand for pipes, nor did the



whites substitute a better-made implement ; therefore, the pipes were retained, and used until worn out or broken, excepting such as were buried with their deceased owners. What was the ultimate fate of these can only be conjectured. Certain it is that in every instance an Indian grave in New Jersey does not contain a pipe. If the practice of burying the pipe with its owner was common, we must believe that the graves were opened and robbed of this coveted article by members of the same or some other tribe." This may be objected to on account of recognition of the stolen property, but "we do not think the fear of detection deterred the ancient grave robber." The circular, trumpet-like bowl form of pipe appears to be the more prevalent New York form of this clay implement. I am indebted for this information to the Rev. W. M. Beauchamp, who also tells us in his article "Comparison of Relics in Ontario and New York, American Antiquarian," Vol. XII., p. 170. "The country of the Petuns, just west of the Hurons, produced many clay pipes. \* \* \* \* Thus the Petuns, who raised tobacco for sale, may have furnished pipes for the smokers as well. The Mauquawwop, or man-eaters, probably Mohawks, were pipe makers, which they bartered with other Indian tribes as far as 300 or 400 miles away. The Delaware Indians bartered pipes from other Indian nations living on and beyond the Mississippi river. The Catawbias, who lived in the western part of South Carolina, were makers of pipes, and they exchanged them with neighboring tribes for raw skins. The Natchez and kindred tribes excelled in the manufacture of pipes, etc., which they bartered among themselves, and Cabeza de Vaca found among the Indians of Texas, a dealer in flint and other articles which he procured in the interior, and brought to the Indians on the coast to either exchange or sell." For the above interesting information the writer is indebted to Mr. Lucien Carr's very valuable paper "The Mounds of the Mississippi Valley, Historically Con-

sidered." Report of Smithsonian Institution, 1891, p. 503. By a careful study of early historical and scientific works, still more information could certainly be gleaned.

*(To be continued.)*

## DONDER-BEITELS.

Editor ARCHÆOLOGIST.

I was interested in Mr. Van Epps' article in June number of ARCHÆOLOGIST on "Donder-Beitels." Many of our Pennsylvania German farmers, ignorant of Archæology, believe that the grooved and ungrooved axes found here are thunder-stones, which fall from the sky at the same time that lightning strikes an object, near to which they are always found. A beautifully polished, square, black celt is in the possession of a farmer living near my home, who insists that it is a veritable thunder-stone, his wife having found it near a tree which was struck by lightning but a short time before. Medicinal virtue is also assigned, not alone to the larger objects of stone, but also to arrow-points and even flakes. The writer remembers once being in the house of a farmer after relics, when to him were brought jasper flakes which were used for pow-wowing purposes. It was said that these incantations never failed, and for no consideration could they be taken away.

The Pennsylvania Dutchmen are descendants of the German race, many of whom believed that celts, as well as other objects of stone, were thunder-bolts. Sir John Evans in his very valuable work entitled "Ancient Stone Implements of Great Britain," p. 52, tells us that the Germans held stone celts, to preserve from lightning the house in which they are kept. They perspire when a storm is approaching ; they are good for diseases of man and beast ; they increase the milk of cows ; they assist the birth of children, and powder scraped from them may be taken with advantage for various childish disorders. It is usually

nine days after their fall before they are found on the surface. We, therefore, can well understand why the belief in "Donnerstein" obtains here.

A. F. BERLIN.

Allentown, Pa., June 10, 1894.

## RECENT DISCOVERIES.

(Up to July 12th.)

Barton Walters opened a mound near Circleville, Ohio, and exhumed several skeletons (decomposed) therefrom.

R. E. Duchee found in northern Indian Territory human skeletons, copper ornaments, axes, utensils, etc. The papers give no particulars.

At Geneseo, N. Y., a flood unearthed pottery, coins, arrow-heads, silver crosses, etc. The site seems to have been a village in 1700, or thereabouts.

Large skeletons, copper ornaments and beads were taken from a rude stone vault near Egan, S. D. The press accounts seem to be exaggerated.

Workmen engaged in digging a cellar in Ponckhokie, N. Y., found three skeletons. A stone necklace (stone beads) and other relics were secured. Two of the skulls are perfect.

In Leverett park, Boston, a flint lock gun, arrow-heads and bones were found.

The large mound under process of examination by the students of Leland Stanford University (California), has yielded several interesting finds. The following from the *New York World* describes a peculiar skeleton: "One of these skeletons is apparently that of an old man who had been a sufferer from a terrible disease, which has caused an extraordinary deformity. With the exception of the second joint in the neck, there was a complete ossification of all the joints in the spinal column, making it as rigid as a broomstick. The ribs were fixed to the backbone, leaving no possibility of motion in respiration. At the points of attachment of the larger

ligaments there were deposits of osseous tissue. This unfortunate man with the immovable backbone did not even possess the advantage of being able to stand upright. His spine was curved forward from the first lumbar. He could never have seen the sky unless his friends turned him on his back.

It is rather surprising that a primitive people should have taken care of such a useless old man, but possibly they thought his shape was an indication of supernatural power.

The larger bone of his left forearm had been broken at some period and reset with considerable skill. The old man was found reposing on a bed of ashes, and his legs had been partially burned."

## A GEORGIA IMAGE.

CARTERSVILLE, GA.

John Keys, a young man of this county has been prospecting for ores out in the mountains, and tells an interesting story about a cave he discovered recently.

Exploring the cave he found it was several times the size of an ordinary room, and its height back under the hill was at least fifty feet. There are little recesses extending out from the main cave. He had a pick with him, and finding the cave had an earthy floor he commenced to dig. His pick soon struck a hard object, which he succeeded in bringing out, and found it was a curious looking image about the size of a child of five or six years of age, and carved out of a brown colored stone.

Around the image was wrapped a curious looking small metal chain, which when unwound from its many coils measured at least twenty feet in length. The chain looks as though it were brass, yet acid does not affect it.

Further digging brought out a lot of bones. These were exhibited to a physician of this city, who pronounced them human bones. The cave and the curious finds made within it are a puzzle to those to whom the story has been given.

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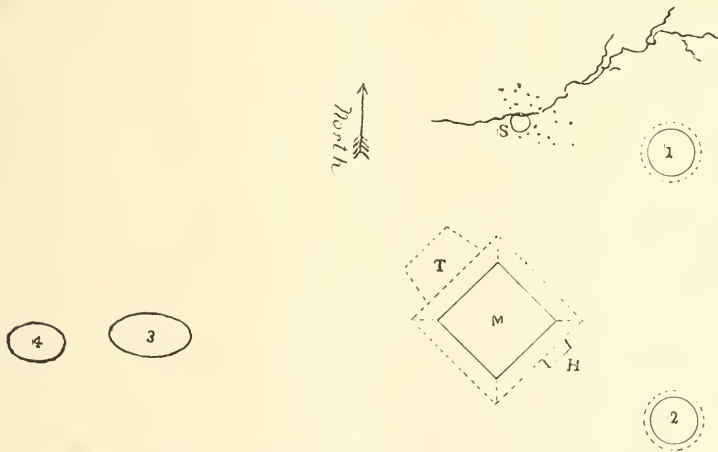
WATERLOO, INDIANA, SEPTEMBER, 1894.

No. 9

## AN ILLINOIS "TEOCALLI."

J. F. SNYDER, M. D.

BY referring to the map of Illinois it will be seen that St. Clair county in that State is immediately opposite the city of St. Louis, Mo., and that Cahokia Creek, coming from the prairies farther east, joins the Mississippi just below the Illinois approach of the great steel bridge that unites the two States at that point. This modest little stream formerly emptied its waters near the ancient village of the same name six miles farther down than its present mouth, but, following the march of modern progress and improvement, it, too, forsook the old historic town, and now pays its tribute to the Father of Waters at the busy, thriving city of East St. Louis.



Following up the course of Cahokia Creek for seven miles to a short distance beyond the point where it emerges from Madison county into St. Clair, and barely within the limits of Madison, near the south bank of the stream, is situated the famous Cahokia mound, with a base covering nearly fourteen acres, and its 1,076,000 cubic yards of earth towering to the height of 97 feet, the most marvelous and stupendous earthen monument of the aboriginal American race in the United States.

Twenty miles above St. Louis the Mississippi, at Alton, washes the base of a line of bluffs 200 feet high, that trend from there eastward, then south for eighty miles, again meeting the great river at Chester, and enclosing between them a scope of flat, level land varying in width from three to nine miles, known as the American Bottom. The Cahokia mound, a huge, oblong, truncated pyramid, stands on this alluvial soil a mile and three-quarters west of the nearest point of the bluffs. All around it, on both sides of the creek to its mouth, and throughout the entire extent of the American Bottom, are many other artificial mounds of less magnitude, and all circular or elliptical in form, while on every knob and ridge of the adjacent bluffs are the shallow sepulchers of the vanished race.

These curious remains of the primitive occupants of this region have been observed for a century or more, and so frequently described that they are now familiar to all students of our antiquities. With this fact in view, it seems passing strange that but a few miles east of them there stands one of the few—and most perfect—square mounds to be found in this State, with other outlying mounds, forming a group, not so extensive as that in the American Bottom, but of equal fascinating interest, no doubt erected by the same people and co-eval in date of structure; that, so far as my knowledge extends, have never yet been described in print by any of our antiquarian writers.

Looking-Glass Prairie, in the northeastern corner of St. Clair county, is a projection of the vast treeless plain transcending in extent the northern and eastern boundaries of our State. Framed in by the wooded hills of Silver Creek on the west and the timbered borders of Sugar Creek eight miles to the east, it is a charming picture; bright and sparkling as a looking-glass; a grand and beautiful landscape of undulating elevations and sloping meadows, diversified by isolated groves and brush-fringed rivulets, now dotted over with orchards and handsome residences, and other embellishments of refined civilization.

On the crest of one of the wave-like swellings of the prairie, a mile and a half from its western edge, is situated the "*Teocalli*" I have mentioned, known locally as Emerald Mound, so named by an early proprietor because of its usual vernal freshness. The exact location of these interesting remains is in Section 8, of Township 2, in Range 6, three miles northeast of the city of Lebanon—the seat of McKendree College—and twenty-four miles directly east of the Mississippi at East St. Louis. They are upon the extensive estate of Hon. Henry Seiter, a young gentleman of wealth and culture and high prominence in the public affairs of the State, who has served the people with marked ability in both branches of our Legislature, and in other positions of trust and honor, and who is now the chief owner of a large banking house in Lebanon, the place of his birth.

Emerald Mound is a truncated pyramid in form, proportioned with remarkable mathematical precision, with symmetrical angles and isometrical lines and slopes. Its base is very nearly a true square, measuring 225 feet in length on each side; in height it is



within a fraction of forty feet above the prairies' surface, and its level apex, conforming exactly with its base, is 150 feet square. It is computed to contain in its composition 54,395 cubic yards of earth, much of which must have been brought from a distance or scraped up from an extensive area of the surrounding country, as no corresponding excavations can be seen in its vicinity. The work was projected with due regard to correct orientation, its angles pointing to the four cardinal points of the compass. The northeastern and southeastern slopes face the open prairie, and from its level summit a magnificent view of the country to the distant eastern horizon meets the eye. The panorama seen by the observer from this elevated point, especially in the early morning in spring, when tinted and gilded by the rays of the rising sun, is one of unequalled splendor. On the northwestern side, at "T," a descending terrace, or inclined approach, is distinctly traceable, that originally sprung from the middle of the mound for its entire width, and extending a hundred feet from its base, terminated in a platform raised two feet or more above the sloping natural surface of the ground. This part of the work has suffered much from the erosive effects of the elements and tramping of cattle; but the mound itself has survived the lapse of centuries with but little disintegration, and still preserves in marked degree the integrity of its lines and angles. For a hundred yards north of the terrace's raised border the ground gradually slopes down as evenly as the shelving beach of the ocean, to a small brook that drains a portion of the prairie and wends its westward course to Silver Creek. Near the bank of this rivulet, beneath the shade of a few stately elms and oaks, there gushed from the earth—before the era of well-digging and corn raising—a bold spring of clear, cold water (marked "S," on the diagram), that furnished the water supply of the swarthy throng that built, and perhaps dedicated to the worship of the Sun, this enduring earthen monument. But the great wells at the adjoining dairy have long since robbed the spring of its gurgling waters, and the rivulet, but for a brief period in the rainy season, has lost its dignity as a water-course.

From the elevated position of the mound the surface of the ground declines gently, but considerably, in all directions, excepting to the west and southwest, where the descending grade is more gradual.

Directly in front of the large mound's northeastern face and 350 feet from its base, is a small circular mound, No. 1, now in a barn lot, and consequently much mutilated, measuring 75 feet in diameter at the ground, 12 feet in height, with a level top 30 feet across. Looking directly to the southeast from the northeastern line of the large mound's quadrangular summit, 300 feet distant from its eastern angle, is mound No. 2, the exact counterpart, in form of No. 1.

On the other side of these works the land, for many years in cultivation, extends towards the setting sun in a long, slowly decreasing ground-swell, slanting very gently to the north and south. On this broad undulation, 600 feet from the western corner of the

truncated pyramid, is mound No. 3, presumably of artificial construction, and probably sepulchral in character. It is of the ordinary, rounded mound form, ten feet in height, with a base length of 150 feet by 100 in breadth. West of this an hundred feet is another similar but smaller mound, No. 4, 75 feet in length by 50 feet in width and six feet high. The long diameter of these two oblong elevations deviates a few degrees from an east and west line, but correspond with the trend of the low prairie ridge on which they were erected. They have been plowed over for so many years that their original height has been materially reduced; but, as yet, their buried contents, if any, have not been revealed.

No investigation has ever been made of this very interesting group of earth works. The main mound, "м," and its two smaller appendages, Nos. 1 and 2, were probably only designed for raised platforms to support dwellings, or other perishable structures, and perhaps contain no buried relics of their builders.

The *Teocalli* (House of God) of the primitive people of Mexico and Central America, many of which still remain in more or less perfect condition, supported and were the chief part of their temples, and were all, whether constructed of stone or earth, in form of truncated pyramids. Earthen mounds with flat tops on which were houses occupied by Indians who had made them, were frequently seen by DeSoto and his followers during their peregrinations through the territory now constituting the States of Georgia and Alabama, in the dawn of the sixteenth century. One of the chroniclers of that marvelous expedition, the Gentleman of Elvas, says:

"The natives always endeavor to build upon high ground, or, at least, to erect the houses of the cacique, or chief, upon an eminence. As the country was very level, and high places seldom to be found, they constructed artificial mounds of earth, the top of each being capable of containing from ten to twenty houses. Here resided the cacique, his family and attendants."

The oblong elevations marked 3 and 4 on the accompanying diagram, if artificial, may be the tumuli in which were laid the distinguished dead, who, in life, ruled the savage horde that ranged these woods and prairies, and toiled to rear these strange weird monuments. Or, they may cover the remains of the high priests who guarded the eternal fire in the Temple of the Sun erected on that lofty earthen platform and consecrated to the Day-God, where every morning they made obeisance to the rising deity, and offered up sacrifices of human victims.

Be this as it may: admitting the hypothesis that the mounds in question are sepulchres heaped over bodies of the dead, the number of individuals they contain must be very few compared with the multitudes that for ages roamed over this region and lived and died about this locality. This obvious fact suggests a question of interest for our solution. What disposition of their dead did these people practice? No cemeteries of buried bodies have yet been discovered here, as at Madisonville and in the Cumberland Valley and Southeast Missouri. Were the bodies scaffolded and desiccated, and

at certain annually--recurring periods gathered together and cremated? So far but few, if any, wholesale crematories of this character have come to light;\* but future investigations, conducted with intelligent observation and wide research, may probably solve this problem and reveal the mystery of their mortuary customs.

Many years ago, Mr. Baldwin, an early proprietor of the premises, built a residence at the point designated by the letter "H," that encroached several feet upon the margin of the mound; and, in making the excavations for the foundation and cellar of this building, the laborers threw out sixteen large flint spades, measuring from ten to fifteen inches in length, and smoothly polished at the broad extremities from long-continued use. In the adjoining fields and about the spring and the lawn-like meadows, vestiges of ancient camp-fires have abounded with scattered flint chips and potsherds; and many stone implements of the ordinary types have been found, denoting long occupancy by a numerous population.

The distance from this system of earth-works to the great Cahokia mound in the American Bottom, on a straight line deviating but a few degrees from east and west in direction, is fifteen miles. That the architects and builders of the two *Tecallis* were contemporaneous and of the same ethnic stock, admits of little doubt. The relations existing between the people clustered about each of these temple mounds must have been intimate and harmonious. When a small boy, I remember hearing the statement made by Rev. John M. Peck—a noted Baptist minister, who came from Connecticut to this part of Illinois in 1818, and afterward founded Rock Spring Seminary, three miles west of Lebanon—that, at that early day, a deeply-worn footpath, or trail, could be readily traced from Emerald Mound through the dense woods, crossing Silver Creek at a rocky shallow ford, to and down the bluffs and continuing through the Bottom directly to the mound on Cahokia Creek. This statement was corroborated by Gov. John Reynolds and other old pioneers of this region. On the top of one of the highest points of the bluffs, where this trail emerges from the uplands into the Bottom, is a large conical mound, locally known as the "Sugar Loaf," which probably served the pre-historic savages, who erected it, the purpose of a signal station. From its summit the eye sweeps over a splendid view of this portion of the great river bottom, with its beautiful groves and small prairies, its many Indian mounds and numerous lakes and creeks, reaching far beyond to the mighty Mississippi and its western border of rocky bluffs, on the crest of which were, long ago, artificial mounds similar to this one—the "Big Mound" of St. Louis, 50 feet in height, could from here be plainly seen—now replaced by the miles of masonry and smoke-clouded walls and chimneys and towers of the rapidly expanding city.

The mounds and other remains of the Indians inhabiting Illinois before the beginning of our written history, with few exceptions differ but little from the same class of relics of the aborigines

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\* See a paper by the writer in Smithsonian Annual Report for the year 1881, p. 577, *et seq.*

encountered throughout the Mississippi Valley; and yet, are but little known to archæologists beyond our own limits. No systematic survey or record of them has yet been attempted. An exhaustive examination of our antiquities is beyond the means of any private individual—at least of that class of persons having the taste and requisite knowledge to undertake it—and there is not the remotest prospect of having it accomplished by legislative authority for generations to come. There is a hope and possibility however that, in the not very distant future this inviting field for research may be occupied, and the work successfully done, by the lavishly endowed Field Columbian Museum, or the Chicago University, or both jointly.

All archæologists are not great and distinguished men; and, unfortunately all great and distinguished men are not archæologists. The eminent scientist who very ably held the position of State Geologist of Illinois for thirty-one years, whose reports are a lasting monument to his genius and learning, and whose opportunities for critically observing the pre-Columbian remains of our State were exceptional, paid no attention to them whatever, and contended that the mounds were natural formations!

I have a distinct recollection of the noon halt of Mr. Charles Dickens in our town, Belleville, in the spring of 1842, when a cortégé of his St. Louis admirers were escorting him to Lebanon to gratify his desire to see a real prairie before he returned to England. Looking-Glass prairie has the distinction of being the first and only prairie viewed—and unjustly vilified—by the illustrious novelist.\* He enjoyed the bounteous lunch provided by his friends in full view of Emerald Mound, and but a short distance from it, yet makes no mention of it in his *Notes*. That he saw it must be inferred from his mention of the Cahokia mound, near which the party passed in returning to St. Louis, as follows: "Looming in the distance, as we rode along, was another of the ancient Indian burial-places, called the Monks' Mound, etc."

It must be born in mind that at that time Archæology was not known as a science, and antiquarians were charitably regarded as inoffensive cranks.

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See Chapter XIII of his *American Notes*.





## ARCHÆOLOGICAL DISCOVERIES IN THE OLD CONTINENT.

THE MARQUIS NADAILLAC.

PREHISTORIC discoveries of any importance are getting scarce on our continent; all the caves have been explored, all places of any interest have been searched and described. We can only expect some finds which will certainly bring very little new light on the first appearance of man in Europe. Mr. Piette has continued with unabated activity his excavations in the South of France, and they have yielded him numerous specimens of remarkably artistic workmanship. I will only mention here two skeletons of heads of horses showing the patient work of the artist (I can give him no other name) to attain proficiency in his art. The *baton de commandement*\* found at Montgaudier (Charente) bears two Phocas (*Phoca vitulina*) which could not even now be figured with more accuracy. Our surprise increases when we think that the man who executed those designs had only for tools some rudely pointed stones or bones, and that metal of any sort was yet completely unknown to him. This remarkable piece of work was excavated from a cave at a depth of twelve metres, covered with mud, sand and remains of all sorts. With it were found numerous fragments of charcoal, worked flints, bones intentionally broken. Amongst these bones Mr. Jaudry has determined those of the *rhinoceros tichothinus*, the *ursus spelæus*, the *hyena spelæa*, and also those of the *bison roiscus*, the horse and the reindeer, which had certainly furnished man with his daily food. Another reason of surprise is that so few of the scattered tribes on our continent possessed even the rudiments of art. The stones or bones on which we see figures of man or of any other living being, are only found in the region between the river Charente and the Pyrenées, and at Thayngen on the confines of Switzerland and Germany. We know few specimens in Belgium, and all too clumsily executed to be called works of art, and in England a horse found at Cresswell and a rude human figure of a negroid type, engraved on a shell lately found at Walton on Narze. Both can be safely carried back to paleolithic times.

We should also mention a male human figure about twenty centimetres in length carved on the tooth of a mammoth, probably an amulet. The figure is naked, the breasts very prominent. It was found near Brunn, in Moravia, at a depth of 4 m. 50 c. amongst numerous bones of elephant, rhinoceros and reindeer. Quite near was a

\* Such is the name given (because we know no better one) to a long bone bearing a variable number of holes and ornaments either of a geometrical pattern or figuring, mammals, birds, fishes or even leaves or ferns. More than a hundred of these *batons* have been found in France. They are very scarce in other countries.

human skull measuring 1,350 c., with a cephalic index of 65.68. The German scientists carry back both the skull and the amulet to the later period of the reindeer. We must add that human figures, either engraved or brought out in *alto relievo*, are always very scarce, and greatly inferior to the representations of animals. It is a curious fact on which our exhibition of 1889 threw much light, and which cannot be accounted for.

An eminent French writer, recently deceased M. Caro, has ably shown in his Essays on Social Physiology the importance of heredity in the culture of art. Heredity may have contributed to the skill of Pyreneans or Swiss Troglodytes. But we actually know no source from which prehistoric art can have sprung; no time to which we can carry back its beginnings. Its creations disappear with as much suddenness as they appear. *Proles sine matre creata, mater sine prole defuncta*. Perhaps some new finds may help us to solve the problem.

M. Piette, to whom we must again return, has also recently found in his excavations numerous pebbles on which are traced with peroxide of manganese various geometrical designs. We cannot tell the signification of these lines or dots, or even if they had any signification at all. Until now these pebbles have only been found in the caverns of the Pyrenees. They can be carried back to the end of the Paleolithic or the beginning of the Neolithic periods. The climate during a great part of these times was milder than in our days. The skeleton of a monkey was recently found at Montsaunis (Hte. Jaronne). The presence of a monkey is not sufficient to prove a mild climate, as Prince Henry of Orleans met Simians in the mountains of Thibet at an altitude varying from 3,000 and 4,000 metres, and in a region marked by intense cold. But with this monkey Mr. Hare has not found any representatives of species such as the reindeer, who only live in the cold climates, and this gives some basis to his hypothesis. We can add that at the end of the Quaternary period the cold in Siberia was much less intense than in our days. Between the mouths of the rivers Obi and Yenessi, with the remains of the mammoth were found specimens of the *sarix*, a tree which has disappeared many centuries ago from Siberia, and the explorers have brought back from the Diakov Islands, situated in the extreme north, numerous leaves of different species of *salix*, which now belong to a much more southern flow.

Other facts show us that at the different periods of prehistoric times Siberia possessed a numerous and advanced population which precludes the idea of extreme cold at Irkoutsk. Count Ouvarof found some stone instruments of the most primitive form. At the Congress of Moscow in 1892, quaternary tools from the foot of the mountains which separate the Russian Empire from Mongolia, were exhibited in great numbers, and Mr. Savenkov proclaimed the same discoveries on the left bank of the Yenissei near Krasnoïarsk by 65° lat. N., with stones of the form called in France *mousterienne*, were some bone instruments and remains of the reindeer, the mammoth and the woolly rhinoceros. At Basailka, on the right bank of

the same river, we see polished stones and small ivory statuettes of pigs and elks. The progress shows itself more clearly near the Tobolysk, where stone instruments of excellent workmanship were excavated. Bronze appears at a time when it was certainly yet unknown in Western Europe. The Museum at Omsk contains numerous tops of lances in bronze from the banks of the Obi. All are remarkably finished, and one of them measures 36 centimetres in length, and is decorated with artistic designs of all sorts of animals. The Yenisei also yielded a great many bronze implements representing the same animals, and amongst them the mammoth, who certainly was the contemporary of the artist who copied him.

It is going far out of our way, but it may be interesting to mention even in the *ARCHÆOLOGIST*, that Mr. Tayol has lately found in the coal mines of Commentry 1,500 fossil insects dating from the earliest times. The types are easily recognized, and present great similitude to the insects actually alive. Of the 62 genera in which they are ranged, 46, tells us Mr. Brongniart, \* are new. The variety of forms at the first dawn of life on the globe is really wondrous.

If we cannot present anything very new on pre-historic Archæology, we are much better off in other branches of the science. Who knew a very few years ago even the name of the Hittites or Khitas, a nation mentioned in the Bible as of Syrian extraction, and of whom innumerable inscriptions have recently been discovered in Chaldea, in Syria and in Asia Minor. These inscriptions cannot yet be deciphered, † though Mr. Menant believes he can tell some words, and amongst others that of Kar Kemis, the chief town of the Hittites. Their existence is proved not only by the Bible, but also by Assyrian and Egyptian documents, now well known. The part the Hittites played was important; for centuries they struggled not without glory, against the two powerful empires, their neighbors; but at last the day comes in the seventh century before Christ when they were conquered by Assar Haddon, King of Assyria. Kar Kemis was taken and fell under Assyrian yoke. The Egyptian Pharaohs equally claim victories over the Hittites. Some of the sculptures at Epsamboul on the Nile relate these victories. The figures present the same type as those found at Kar Kemis. The men have their heads close shaven with the exception of a long tail like the Chinese of our days. Of course we have yet much to learn about the Hittites. The reading of the inscriptions, which is deferred, will certainly complete our knowledge.

The discoveries of the Germans at Sendschirli in Northern Syria, recently published at Berlin, must also be mentioned. The Germans, who were late in the field, have nothing which can be compared to the great finds at Korsabad, Nimroud or Susa—nothing that can equal in historical importance the discoveries of M. de Sarzec at

\* *Acad. des Sciences*, 21 mai, 1894.

† *Sayce, hist d'un Empire oublié, trad. franc pas Mr. Menant—Peisel, die Hittischen Inschriften*, Berlin, 1892—*Oppert, Acad. des Inse*, 10 mai, 1892. Mr. Wright published a few years ago 25 plates of these inscriptions. Since then numerous others have been brought to light. All of them are written in boustrophedon.



Telloh. Yet there is an undoubted interest in the small kingdom of Sehamal and in Sendschirli, probably its capital. It formed part of the Hittite Empire, and when that Empire succumbed, the Sehamals maintained a semi-independence under their national kings, who ranked as vassals of the king of kings till about 670 B. C., when they were completely brought under the Assyrian yoke. Statues and *basso-relievos* show us what were these men; numerous inscriptions give us some insight of their glories and their miseries. One of these is most important; it shows that in the ninth century B. C., the Semites, to which race the Hittites belonged, believed in the immortality of the soul, and in reward or punishment after death. King Panammu I says this inscription beseeches his descendants never to omit the offering of a libation to him on the day of their coronation. It continues: "When his name is called, the soul of Panammu will drink with thee, but if this ceremony is neglected, the offerings will be rejected by Hadad, and the soul of Panammu will drink alone with Hadad." We hope that other discoveries will put out of doubt the religious and philosophical beliefs of the Semites.

M. de Sarzec's discoveries at Telloh, the ancient Sirpoula, allow a much clearer insight on the Chaldeans.\* They show a long line of kings contemporary of the oldest Egyptian dynasties, who reigned in Chaldea more than forty centuries before the Christian Era.

A new abode of forty ancient kings has just been discovered. This time it is not a palace similar to the palace of Goudea, but a number of detached buildings which cannot be better compared than to a Roman villa. As we follow their suite, all are useful for a large culture, storehouses, cellars, cisterns, water conduits. All these buildings correspond exactly with those mentioned in the inscriptions lately deciphered, and specially with the farm described by Amiaud under the name of *la Maison des fruits*.† Numerous objects useful as furniture, agricultural or industrial tools have been excavated. They show the advanced civilization of these ancient dynasties; their way of living; their artistic knowledge and their wealth. Some of these finds are now in the Museum of Constantinople. Amongst them is a lance either in bronze or copper, measuring 0.80 in length. This lance is very similar to the one in the hand of En-an-na-dou on the *stèle* of the vultures, and to those often carried by Tsdoubar or Gilgames, the Chaldean Hercules, to whom it was probably dedicated. We know other instances of such offerings. The pious King Our-Nina presented votif arms to the god Nin-ghir-sou in his temple at Sirpoula, and Mr. Henrey mentions a stone club which probably had the same destination.‡ It belonged to Nin-ghir-sou-mou Patesi of Sirpoula.§ On the sides we see most primi-

\* *Ses decouvertes en Chaldée* published by Mr. Henry, give the ground plan of Telloh and beautiful specimens of the objects discovered.

† *Decouvertes en Chaldée, partie épigraphique* XXIX. à XXXI.

‡ *Bul. Acad. des Insc. Aout, 1892.*

§ We are not very well fixed on the title of *Patesi*. The Patesis were probably in some cases the lieutenants of the kings; in others the vicars of the high priests,



tive sculptures. On one of these sculptures six lions run one after the other, and above them is an eagle-headed lion. Two of the lions carry rudely engraved inscriptions. On one of these is the royal sign; on the other the temple of Nin-Ghir-Sou, the names of a Satesi and of two towns governed by him. These weapons were precious monuments to the ancient Chaldeans, and probably older than the numerous tools or instruments belonging to the stone age, and so are carefully preserved in our museums.

Small statues, probably anterior to King Our-Nina, and now in the Louvre, allow some insight into the religious beliefs of the Chaldeans. The assayings of Berthelot show that these statues are of copper without alloy. They represent the bust of a woman, and finish in a long and sharp point. M. de Sarzec found them fixed on the ground, and bearing on their heads small votif tablets. They probably were magic forms, whose duty was to guard against the approach of evil beings.

The latest discoveries of M. de Sarzec allow us to give a list of Chaldean kings, descendants of Our-Nina and of his grandson En-anna-dou, the warrior king. Amongst them we can mention the Patesi Entemena, according to the reading of Mr. Olyrert. The excavations at Telloh brought up a stone with an inscription showing that Entemena was a son of a Patesi named En-anna-toumma, and father of En-anna-toumma II. Mr. Henrey was lucky enough to complete these discoveries by finding in the Museum of Constantinople a curious mortar which had belonged to En-anna-toumma I. It is cut in a dark green stone, and bears an inscription. Unluckily the stone was partly broken, and some words remain illegible. Mr. Henrey reads them thus :

To the god Nin-Ghir-Sou,\*  
Warrior  
of the god Ellela.  
E-anna-touma.  
Patesi af Sirpoula.

— — — — — †  
Of the god Nin-Ghir-Sou,  
(Son of) ‡ Akowgal,  
Patesi of Sirpoula.  
— — — § of wheat,  
for the prolongation of his life  
to the god Nin-Ghir-Sou. ||

The most part of this inscription is the mention that En-anna-touma I. was son of a Kourgal, whose own son was En-anna-dou, the king, we see in the *stèle* of the vultures. We can now give a genealogical table of the kings who reigned, as I have said, in Chaldea forty centuries before our era. They stand thus :

\* Nin-Ghir-Sou was the great local god.

† Words missing.

‡ A word missing, probably the one we insert

§ Words missing.

|| Last words illegible.



The pyramid of Dahchour, distant 36 kilometres from Cairo, and not far from the Nile, is situated on the limits of the desert, and belongs to the Sakkarah group. It is built of raw materials, and the only idea it conveys to the visitor is that of a heap of earth. Herodotus mentions it in his journey through Egypt. "The Dahchour pyramid," says the father of history, "with its modest appearance, conceals more hidden treasures than its superb neighbors." M. de Morgan relied on the words of Herodotus, and a rapid success crowned his faith.

After the first excavations which I have already described, the workmen brought to light under a heap of sand and rubbish several vertical wells, which gave entrance to tombs belonging to the XII. Dynasty. After following, not without great and even dangerous difficulties, a low and winding tunnel, the explorers gained admittance to a funeral chamber, and discovered a small wooden statue covered with gold leaves and bearing two royal cartouches, Aou-ab-ra and Hor. In another room adjoining the first were two coffins. One was in the form of a haos, particularly designed to bear the effigies of the defunct princes. In the Egyptian belief, the dead at different times visited their tombs and animated their images. The haos was partially enveloped in golden leaves, and on one of these leaves was stamped a winged disk, the mark of Houdit, the master of heaven. The figure enclosed in the haos measured 1 m. 35 c., and was made of acacia wood, covered in some places with plates of gold, and neatly finished all around were numerous fragments of pottery and offerings to the defunct. These offerings were in wood, certainly sufficient for the sustenance of life after death. Amongst them were two alabaster tablets bearing funeral rituals similar to those found in other pyramids.

The second coffin was equally made of acacia. In it was the mummy of King Aou-ab-ra of the XXI. Dynasty, the son of Hor. This mummy was wonderfully preserved. The head was covered by a gold mask with crystal eyes inserted in bronze. The whole body was covered with a marvelous set of royal ornaments, and in the Pharaoh's Sarcophagus were found a number of solid gold pins and resillas of gold pearls and cornelians.

Success continued to follow the well-directed excavations of M. de Morgan. A few days after the discovery of the body of King Aou-ab-ra he came upon the tomb of a royal princess. In a well adjacent to the first he found a door giving entrance to a secret passage 14 m. 50 c. in length, and covered by a cylindrical vault of remarkable construction. It opened on a small chamber which had never been explored since the day of the burial. There laid vases containing water from the Nile, embalmed pieces of meat, dishes full of dainties completely dessicated. Two boxes attracted our explorer's eyes; one full of perfumes carefully preserved in alabaster vases bearing labels in hieratic writing, and the seal of a servant of King Tesch-Sembet; in the other box were canes, sceptres, a wooden looking glass and numerous arrows. Nothing yet enabled him to say whether the tomb belonged to a man or to a woman.

The suspense was not long. The sarcophagus was opened, the flag-stone which covered it raised, and the coffin with its covering of gold appeared. An inscription in golden letters ran all around the lid. It proclaimed the name and titles of the royal daughter Noub-Hotep-ta-Khroudil. Damp had caused great injury to the mummy, and there only remained a few bones and dust, the last remnants of humanity, and with them numerous jewels and trinkets, tokens of pride and wealth, the whole enclosed in a covering of gilt plaster. On the head were a silver coronet with a number of precious stones an arrow and a vulture's head in gold. Around the neck a superb necklace in gold with fifty pendants, amongst them two hawk heads of natural size; near the waist a dagger with a gold blade; on the arms and ankles gold bracelets ornamented with pearls, emeralds and cornelians. On the left side canes, sceptres, a flagellum in a very fine condition. Seldom was a richer treasure discovered in the old land of Egypt. M. de Morgan adds that he found in many places the royal sign, but it nevertheless seems that neither Princess Noub-Hotep nor her consort ever ascended the throne, as their names are not found in the royal calendar. Before these last finds, M. de Morgan had searched in March last the tombs of the Princess Hathor-Sat and Sentet-Senbet. We have the list of jewels and trinkets brought to light. They number 148,\* now deposited in the Museum of Cairo, where an eager crowd surrounds them. The chests in which they were contained are long decayed, and the ground was strewn with necklaces, pendants, pectorals, shells and imitations of mammals, all in gold, with jewels of every description, amethysts, lapis-lazuli, turquoises, emeralds, looking glasses mounted in gold or in silver, vases in lapis or in cornelian, in obsidian or in alabaster, with gold handles, all mixed up with the sand of the desert or the dust of the dead. The richness of the materials is enhanced by the artistic execution, which equals the workmanship of the jewels of Queen Aah-Hotep more than 5,000 years old, which created such a sensation when exhibited in Paris in 1889.

If we return to Europe, the Etruscans show a no less remarkable civilization. Here is a race we can trace in the central part of our continent. There it lived for 500 years amongst nations all well known to us, and attained a state of culture which none of the other races either equalled or surpassed. Their bronze implements, their jewels, their *basso relievos* remain as models; and their artistic conceptions were such that some archæologists attribute to them the celebrated winged lion of San Marco at Venice. Yet notwithstanding our great scientific progress, the origin of the Etruscans remains unknown to us.

Hundreds of inscriptions recall their memory, but these inscriptions are as yet illegible; we scarcely know more than twenty words of their language, and we can only say that the letters present some likeness to the Greek letters. Sooner or later the Agram manuscript, an Etruscan funeral ritual so strangely discovered on the linen bands

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\* J. de Morgan, *le tres or de Dahchour*.



which wrapped up an Egyptian mummy, will be deciphered and will certainly add to our scanty knowledge of this talented nation.\*

Already M. Casati de Casatis has attempted the study of the ancient laws of the Etruscans. By their monuments, their inscriptions, by the writings of the Roman historians, he tries to solve the problem. A *basso relievo* lately discovered initiates us to the form of an Etruscan marriage. By it we learn the origin of the *confarcatio*, the primitive form in use at Rome. A looking glass in the Kircher Museum shows us under her Etruscan name of *Lasa Vegu*, the nymph *Veogia*, whose sacred book was preserved among the Sybilline, and of whom only short sentences have reached us. To M. Casati de Casatis belongs the merit of having been the first to show us the origin of the Roman law and of those principles which still exist, to a more or less extent, in all the laws of civilized nations.

But I must repeat that neither their laws nor their artistic works can reveal to us the origin of the Etruscans. Numerous have been the suppositions brought forward, but to all insuperable objections can be opposed. Mr. Tolasi believes that they belong to the Basque family. Professor Giuseppe Sergi, after a long study of the crania said to belong to the race, speaks of the Sybians a branch of the Iberians, and if I am not mistaken, my eminent friend Dr. Brinton takes the same side, on account of certain analogies of language, religion and culture. Solomon Reinach sees some likeness in the Cilician and Etruscan names. But by far the greatest number of ethnologists past and present connect them with the Argus, a very vague and every day a more unsettled term. Here we must leave the question till some new discoveries, if ever they are made, lead us to more serious conclusions. The Etruscans were contemporaries, and probably of the same race as the Pelasges, the imitators of the glorious culture of the Greeks. Schliemann's discoveries at Mycena show the rapid progress of this civilization, and each day brings us fresh proofs of the height it attained.

The French school established at Athens continues with its usual success the excavations at Delphos, and if our hopes are not deceived, its members will have soon brought to light all the monuments erected on this far-famed spot. The latest finds have been a head of a horse in marble, which probably belonged to the frieze of the temple of Apollo, six metopes from the Athenian Treasury, representing a fight of the Amazons and Theseus struggling with the Minotaur. Other tablets coming from the Siphnos treasury figure the Battle of the Giants. On the sacred road going to the north remains have been found of a great temple, and we trust that our friends will soon discover the Corinthian Treasury, the principal object of their actual search.

A most interesting discovery is that of another hymn with the ancient musical notation engraved on a marble slab. A few months ago we knew nothing of Greek music, and now we are able to say that the Greeks were as proficient in this art as in the others. M.

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\* Krall, Die Etruskischen Mummienbinden des Agramer National Museum.

Theodore Reinach, with much learning, has established the value of each note, and at a concert lately given in Paris, this old music was greatly applauded by a select audience.

We have given a rapid summary of the most recent discoveries on this side of the Atlantic. We will not fail to let our American friends know any salient, Archæological or Prehistoric facts which the future may reveal to us.

Paris, June 12th, 1894.

### COLLECTIONS IN ROSS AND PICKAWAY COUNTIES, OHIO.

W. K. M.

RECENTLY, while visiting the chief "relic centres" of southern Ohio, I was impressed with the extent of the collections possessed by individuals. In '87 and '88 there were comparatively few cabinets of size in the lower Scioto Valley. Today the collections number upwards of one hundred and many of them contain more than four thousand objects. This remarkable growth is the direct result of extensive explorations — not that the collectors themselves have dug to any great extent, but that surveys sent by Eastern and Western Institutions have made important finds and thus stirred up the local collectors. Nearly every farmer of the lower Scioto saves relics found in his fields for one or more of the collectors. The prices paid for pipes, slate objects and the better grades of hematites and axes, etc. are surprisingly high.

In Chillicothe alone there are nineteen collectors, and these gentlemen possess upwards of eighty pipes and other fine specimens in proportion. Yet with all the collecting and digging there yet remain more than eleven hundred mounds (unexplored) in the lower Scioto, or about seventy per cent. of the original number left by pre-historic man.



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## EDITORIAL.

UP to the present time there seems to have been very little activity on the part of museums and collectors. This is largely due to the prevailing hard times. The editor received information from the most prominent museums in the country that several surveys would be sent out this summer. Some of these surveys may take the field later in the season, but up to date only two — the University of Pennsylvania and the American Museum of Natural History — have done any exploring.

It is extremely easy for collectors to keep an accurate account of specimens found or pur-

chased. A collection without a catalogue is of but little value either to other collectors or to scientific institutions. So far as is possible, collectors should keep not only a catalogue of the locality from which specimens come, but a series of drawings and photographs illustrating more in detail each find. Even should the drawings be rather crude, they are much better than no drawings at all. Collectors make a great mistake in failing to preserve a complete history of every specimen. Most of them do not realize the importance and value of a collection properly recorded. There are so many collections in the country that if one desires to rank high he must preserve the field notes, the drawings of the work which he has done, the photographs, etc.

WE DESIRE once more to call attention to the wide field which THE ARCHÆOLOGIST covers. No publication of this character is printed (monthly) in the world. It deserves the hearty support of all students, scientists and collectors. We want the addresses of all persons interested in Archaeology, and beg that our readers will send us the names of such persons. Collectors are also requested to recommend THE ARCHÆOLOGIST to their friends and to secure for us new subscribers.

AS WILL be seen by Mr. Mercer's report in the latter part of this number of THE ARCHÆOLOGIST, the occupation of eastern American caverns has been practically settled. Mr. Mercer in his extended investiga-

tions has not found evidences of glacial man or of the pre-Indian man. No work in American Archæology which has come to our notice has surpassed that of Mr. Mercer's in point of fine detail, careful analysis, etc. The University of Pennsylvania is to be congratulated upon possessing such a thorough and competent scientist.

The editor regrets that lack of space prevents the reprinting of Mr. Mercer's article upon the "Re-exploration of Hartman's Cave, Pennsylvania, '93," and the progress of field work as published in the *American Naturalist* for July, 1894.

NOTE—An unavoidable delay in the preparation of the illustrations for Professor Montgomery's article makes it necessary for us to defer the publication of the second section until next month.

## BOOK REVIEWS.

(Publications received.)

The Pamunkey Indians of Virginia. By Garland Pollard.

The Maya Year. By Cyrus Thomas.

Bibliography of the Wakashan Languages. By J. C. Pilling.

The above three pamphlets are published by the Bureau of Ethnology, Washington, 1894.

Journal of the Cincinnati Society of Natural History for April and July, 1894.

The Progress of Anthropology in 1892. By Prof. O. T. Mason.

The Birth of Invention. By O. T. Mason.

Both these pamphlets were printed in the Smithsonian Report for 1892.

Technogeography. By O. T. Mason.

Migration and the Food Quest. By O. T. Mason.

Reprints from the *American Anthropologist* of April and July, 1894.

## COLLECTOR'S DEPARTMENT.

### PITTED HAMMER-STONES.

Mr. J. D. McGuire has proved by his valuable experiments that much of the stone carving in the stone age could have been done by battering and pecking with rounded stones or pebbles artificially pitted on the sides, so as to hold lightly between the thumb and second finger, and thus strike without jarring the arm, about 200 blows to the minute. He is inclined to infer from this (*Am. Anthropologist*, July, 1893, page 318) that wherever you find what we have been calling pitted hammer-stones in prehistoric rubbish you find proof therein that the hammer-maker knew how

to carve stone (*i. e.*, was in the Neolithic, or at least beyond the Paleolithic stage of culture). But Brough Smith (*Aberigines of Victoria*, p. 383) found savages beating roots with such stones. Caleb Lyon (*Bulletin N. Y. Ethnological Society*, Vol. 1, p. 39) saw Shasta Indians in California about 1860 splitting obsidian pebbles for arrow making on anvils of compact slate head on their knees, as Schoolcraft (*Indian Tribes*, Vol. 3, p. 467) saw jasper lumps shivered for flakes on similarly held basal stones. It seems probable from a series of 67 specimens collected by me from 15 camp sites (Gallows Run, Gilmers Island, Upper Black's Eddy, Lower Black's Eddy, Paul's Valley,



North Branch, Robert's Farm, Graham Park, Dark Hollow, Pauna Crossing, Cook's Run, Bartleman's Farm, Magill's Farm and Mill Creek) in the Delaware Valley, that some of these scored pebbles, all of which would generally pass for hammer stones, may have been used as "anvils," and thus have formed part of one of the many arrowhead-making processes. If a stone blade chipper wanting fresh flakes had set one of his hammers on his knee and splintered a lump of jasper set upon it with another hammer, my experiments show me that he would have produced the erratic dents and scorings rather than the pits that characterise many of the Delaware Valley specimens. Yet several so pecked seem on trial too light to use as "anvils." Fifteen are pitted only on one side, and four show no signs of use on their peripheries. Six are elongated three times their diameter, and one is a flat tablet seven inches long and one thick, which might have served as one of the basal stones set in a notched tree for large blade-flaking by pressure mentioned by Clement L. Webster (Smithsonian Rept., 1887, part 1). In my experience pitted stones are rare in the excavated blade rubbish at Indian quarries. Out of 107 pebble hammers found underground in the ancient argillite mines at Gaddis Run in May, 1893, only two were found scored on their sides. Though I unearthed none in my excavations in the Lehigh Hills quarries, Mr. Gerard Fowke sent one at least to the University of Pennsylvania from Flint Ridge, where it may have come from the arrow-head workshops near the ancient diggings, rather than from the diggings themselves. However this may be, the typical American Indian quarry hammer-stone thus far found, lacks pittings, and the pitted hammer common near the finer blade refuse of village sites, if used in flaking at all, may rather have served at the end of the operation than at the beginning, and where, as I have heard it suggested, light elastic taps might have helped to do some of the finer work. Still, to my knowledge,

none of the eye witnesses of Indian flaking blades by (a) direct percussion, (b) indirect percussion or hammering on hunches, (c) direct pressure on bone tools, (d) impulsive pressure, or pressure aided by a blow, and (e) by pressure aided by heat, noticed pitted hammer-stones used in the process.

For carving other stones, the scorings of my specimens, however irregular, were in all cases of decided assistance in holding the hammers by Mr. Guires' method, with thumb in one pit, second finger in or against the other, and index finger lightly resting on the periphery. In this way I made an axe groove around a hard, sandstone pebble, with a trap boulder and a quartzite hammer-stone in about an hour, striking with the latter near 190 blows to the minute. Grasping the hammer with the whole hand, or holding the fore finger in a pit, strained certain muscles below the elbow, tired the arm and took the very effective rebound out of the blows.

When we have learned how the pits greatly facilitate monotonous hammering on rock, we see why they would help, as Brough Smith says, to pound roots. Two of my Delaware Valley specimens are little rectangular pieces of soft shale, and would never do for stone work. One has two pits on one side against one on the other.

I know of no proof for or against my guess (ARCHÆOLOGIST, June, 1894, p. 192), to which the editor, Mr. Moorehead, objects, that pitted hammer-stones may sometimes have taken the place of the American stone pestle for pounding maize. I think that though too light for sun-dried grain, they might do pretty well for crushing unripe or the easily pulverized parched kernels in large mortars. Time and weather must have destroyed for Archæology proof of many ancient pounding processes upon animal and vegetable fibres, and the meaning of hammer-stones, whether pitted or unpitted, has been little regarded in Europe at the very points (the drift gravels and caves) where their presence most concerns Science. Hardly more has their study been

pursued in the United States, and while our observations and experiments are yet unsupported by extended investigation in the field, and beclouded by the false witness of the collector and "relic hunter," who have denied hearing to all but "pretty specimens." We hesitate to infer that a pitted hammer-stone is always a stone carver's stool, and that its discovery is proof of neolithic culture.

H. C. MERCER.

## INFORMATION FOR COLLECTORS.

(Concluded.)

*Tubular Pipes*—Those long, cylindrical, funnel-shaped objects having the appearance of our modern cigar-holders in an exaggerated form, and measuring from 1¼ inches to very nearly a foot in length, are found in many sections of the United States. They are common in southern California and the islands along the Pacific coast. They seem to be more numerous in California than elsewhere. Bone, copper, stone and clay were the materials used in their manufacture. Sixteen of these nicely wrought implements taken from graves at Dos Pueblos and La Patera are shown in Vol 7, Archæology, Report of U. S. Geographical Surveys, west of 100th meridian, Lieut. George Wheeler in charge. A number of them still contain the mouth-pieces made from the small, hollow bone, either from the wing or leg of a bird, which were secured into the tube by asphaltum. They are all made from a soft, soapy stone called steatite.

The late Paul Shumaker, in a note sent to Peabody Museum, Cambridge, Mass., describes them as follows: "The pipe is a funnel-shaped tube like a thick, enlarged modern cigar holder, with an opening usually over an inch at the wide end, which narrows to one-third of an inch toward the other one of corresponding decreased thickness. The hole was drilled from both ends, but only to a short distance from the

smaller, and the mouth of the pipe was then enlarged by scraping parallel with the longer axis. As a mouth-piece, which protrudes about an inch, a piece of a wing or leg-bone of some bird was inserted and tightly secured with asphaltum. The pipe was usually made of steatite, and is sometimes neatly finished. Among the Klamathlis of the present day a pipe of like form is smoked, and it amused me to see them bending back their heads to bring the pipe in a vertical position so as not to lose any tobacco (which I found a sickening narcotic; they smoke still the native tobacco, *nicotiana attenuata*) while taking a long draught, which was inhaled to longer enjoy the short opportunity, as the pipe must be passed on."

Of the pipes of this class from Ohio, Prof. F. W. Putnam says: "These tubes of stone, clay and copper,\* approach as near to the long tube-like pipes made of stone and still used by the Utes, that I can hardly refrain from classing them with pipes. The principal difference consists in these tubes having what would be the mouth-piece made by the termination of the pipe itself, while in the stone tubes, that are unquestionably pipes, the mouth-piece is probably made by inserting a hollow bone or reed. \* \* \* There has recently been one received at the museum which was collected in Massachusetts."†

Dr. C. C. Abbott has found tubular objects of stone and clay in New Jersey, one of them 6½ inches long. These, he seems to think, may have been "medicine tubes"; but of another similar object which he has shown as Fig. 179 in Smithsonian Report for 1875, he says: "An unquestionable pipe from New Jersey is practically of the tubular pattern inasmuch as the hole for the insertion of the stem is directly opposite the main orifice, or mouth of the bowl."

A few tubular implements nicely wrought and polished, about nine inches long, were

\* The editor has often heard of copper pipes, but he never saw one. He doubts if any exist.

† P. 73, Tenth Annual Report Peabody Museum, Cambridge, 1887.

seen a number of years ago in a small collection at Reading, Pa., by the writer.

In the writer's collection of pipes is a tubular instrument about five inches long, which is an exact imitation of our small, plain cigar holders. It was made from a reddish slate and nicely polished, and was found in Ohio. Another is a clumsy, heavy funnel-shaped implement made of sandstone, and found near Crawford, Miss. It weighs several pounds, is five inches long, and two inches wide at the orifice of the bowl.

Squier and Davis describe and figure several of these stone tubes in their "Ancient Monuments of the Mississippi Valley," and they suggest that the objects may have been used as pipes.

Copper was hammered into many implements and ornaments. Why should not pipes, also, have been made from it? If the Indians on the Hudson river were seen with them, others in the interior and far away from this spot may also have smoked with them.\* Parts of deer's antlers were sometimes cut into pipes. A specimen of artistic workmanship found in the State of New York, is owned by the Rev. W. M. Beauchamp. It is made from part of the antlers of a deer, has a wooden stem which is held in place by a buckskin thong, and belongs to the last century. Most elaborate and artistic pipe-makers were the Indians of the Northwest coast, who worked not alone well in stone, but also in ivory. Many beautiful examples from here, representing men, animals, reptiles, etc., can be seen in our museum. Hard wood, too, may have been wrought into pipes, many of which are certainly of artistic design, but these have all been destroyed by the elements.

"The natives of the Isthmus of Darien seem to have been the inventors of the cigar. In 1861 Dr. Lionel Wafer found them using rolls of tobacco as thick as the wrist and *two or three feet long*." When

assembled together and they want to smoke, he writes in his journal, "a boy lights one end of this roll, wetting the tobacco above its lighted end, so that it will not burn too fast. He then takes the end of this roll in his mouth and blows the smoke in the nose of each one in the assembly, even when 200 or 300 in number. The Indians sitting on benches, as is their wont, hold their hands around their noses like a tube to receive the perfume."\*

"When Columbus and his men landed upon the coast of Cuba they beheld several of the natives going about with fire-brands in their hands and certain dried herbs, which they rolled up in a leaf, and lighting one end, put the other in their mouths, and continued inhaling and puffing out the smoke. A roll of this kind they called a tobacco, a name since transferred to the plant of which the rolls were made. The Spaniards, although prepared to meet with wonders, were struck with astonishment at this singular and apparently nauseous indulgence."†

Edwin A. Barber, in "The Continent," p. 421, says: "A large, trumpet-shaped stone pipe, found in the vicinity of Santa Fe, New Mexico, and at present in the collection of Mr. William S. Beebe, of Brooklyn, N. Y., is believed to be amongst the finest American pipes extant. The bowl is carved to represent an eagle's head, on the back and sides of which lilliputian figures of men appear in relief, whilst along the stem four rattlesnakes are stretched in life-like attitudes." Mr. Barber does not tell us whether it is pre-historic, but the writer is inclined to believe that it is modern.

The finest pre-historic pipe extant can be seen in the collection of Mr. E. A. Douglass, New York city. It is made from a dark grey slate, composed of bowl and stem, was found in the Central American State of

\* Hudson, and other early explorers, may have mistaken catlinite pipes for ones of copper, the colors being similar.

\* "The Pipe of Peace," Edwin A. Barber, in "The Continent," Vol. 3, p. 421.

† "Life and Voyages of Columbus," Vol. 1, p. 183, by Irving, who quotes from Navarette, tome 1, p. 51. This antedates Dr. Wafer's discovery nearly 200 years.

San Salvador, and was taken from the old Indian workings of the Flamenco mines, which, so it is said, was worked by the aborigines before the coming of the Spanish adventurers and thieves. It is a portrait pipe  $4\frac{1}{4}$  inches long, bowl two inches high. Mr. Douglass describes the extraordinary part of this pipe in the following language : "The most remarkable characteristic of this pipe is found upon the exterior of the bowl. It presents three faces that may well be considered portraits, so carefully and minutely are the features rendered. In front is a male face of a quiet, placid character, the forehead high and well rounded, the nose slightly aquiline, the lips thin, showing the teeth, the chin small and delicate. The face is full ; the eyes rather widely apart, and punctured for pearl on gold. About the ends of the mouth is a faint trace of mustache, a characteristic which, though rare, is still to be observed among certain of the Indian tribes in Central America. This face is flanked on either side by a female face or mask of the same size as that just described. On the one side the face is full and round ; the eyes drooping and slightly oblique ; the pupils punctured for pearls ; the cheek-bones high and rather prominent ; the lips are parted, showing the teeth ; the chin small and delicate ; the general expression placid and quiet. Upon the other side the face is less agreeable, and may possibly be the portrait of a very aged person. The projecting eyebrows are more distinctly bowed ; the eyes wide open ; the pupils distended, and wanting the puncture. On either side a deep wrinkle runs from the nostril to the extremity of the mouth, which latter shows both the upper and lower teeth, whilst the upper set alone is visible in the two other portraits ; the lower lip is hardly perceptible, and there is a depression in the chin."\*

Mr. Douglass saw in the British Museum "a pipe of apparently similar stone, of about the same design, with three faces

similarly arranged but totally different in the features represented." It is said to have come from the Esquimaux of Russian America. Mr. Douglass owns over 300 North American pipes, and he writes : "I may venture to say a word as to the scarcity of pipes with bowls set angularly upon the stem among the Indian tribes occupying Mexico and the Central American States, at the time of and subsequent to the advent of the Europeans.

"Throughout the area of the United States such pipes have been found abundantly, and their characteristics are well known to collectors, but as we go southward on the continent through Mexico and Central America, they become most rare, and are seldom to be seen or studied."

The writer owns a curious oblong pipe a little more than an inch long, having no stem. On each side of the angles are cut a number of notches, perhaps tally marks. Three of the surfaces have engraved upon them, which run the whole length of the pipe, three zig-zag arrow-headed lines. The central line pierces a circle placed at the top of each face, from which extend many radiating lines. The side into which has been cut the perforation is a blank. The bowl will hold the contents of a medium-sized thimble. Herbs with narcotic properties other than tobacco may have been smoked in it. It was made from green stone, and was found in Ohio. In the collection of the Academy of Sciences, Philadelphia, Pa., is a "compound calumet or council-pipe" of unusual form, found in a grave on the almshouse property, in Blockleyfield, West Philadelphia. Associated with it was a necklace of fifty perforated stone beads ; the central, perhaps an amulet, being cut into the shape of an eagle's head. The pipe is of a hard, light gray soapstone, cylindrical or tapering in form, and nearly six inches high. About two inches from the base, which measures  $8\frac{3}{4}$  inches in circumference, is to be seen a groove which encircles it. Into this have been cut four holes, equally apart in space, extending

\* American Antiquarian, Vol. 11, p. 351.



apart in space, extending obliquely downward to the base of the bowl. The holes were undoubtedly intended for four smokers at a time, they being so inclined that were stems placed into them several feet long the mouth-pieces would be in correct position for the smokers sitting around it.\*

Mr. Wm. W. Adams, of Mapleton, N. Y., owned a number of years ago a clay pipe found in February, 1884, in an Indian grave at Scipio, Cayuga County, N. Y. It is about six inches long. The front or the bowl represents the head and beak of a large bird. It is of the curved or trumpet form so plentiful in the State of New York, and it is said to be the finest ever found in that section.†

There is another kind of pipe which the writer has almost failed to mention. This is the form called the "inverted bottle-stopper." They are short and clumsy; small at the top and large at the bottom. They are exceedingly rare.

The pipe carved to imitate the head of the human being is also considered a distinct type, but the writer has placed them with the pipes which are carved to represent the human form. All types representing life may be classed as effigies.

So great is the variety of noticeable pipes that many more pages could be covered in writing of them, but more space has already been covered than was originally intended, and the writer lays down his pen with the hope that his efforts will have been received with at least a little appreciation.

A. F. BERLIN.

### Explorations of the de Lancel Fund for Linguistic and Paleographic Research.

The field of operation during 1893 and 1894 has been Southern Mexico. The work has been carried on under the direction of Dr. Hilborne T. Cresson of the Bureau of

Ethnology. Valuable results have been obtained in the districts of Taber County, Chiapas, and Taumalipas. Dr. Seler's report of extensive ruined structures around the headwaters of the Rio Panuco have been confirmed. The ruins of Teotihuacan, Cholula and Mitla were visited. While at the city of Mexico a careful study of the centre slab of the so-called "Cross Group" from Palengue was made in conjunction with Dr. Max Buchner, of Munich, now traveling in Mexico. Dr. Cresson returned North early in the season, but the work will be continued in Huasteca during the hot season by residents of Taumalipas, acting under Dr. Cresson's direction. Valuable photographs have been secured and other material calculated to aid in paleographic work.

I am much interested in your magazine,  
THE ARCHEOLOGIST.

JOHN FISKE,  
Cambridge, Mass.

### RECENT DISCOVERIES.

(Up to August 12th.)

Copper knives, pipes and other relics found in a mound at Savannah, N. Y.

An interesting find was made at Anderson, Ind. Skeletons and rough cloth were found in a mound in the city "addition." The usual lie about the great height of the persons spoils the article.

Space does not permit me to discourse upon the following finds: Spears, pipe and axe at Orleans, Ind.; ruins at Prescott, Arizona; Norse explorations in Mass. by Gerard Fowke.

An archæologist claims attention for the country around Tampa Fla., as a promising field for exploration. He says: "Within a radius of twenty-five miles of the city, there are the remains of ancient canals, numerous artificial lakes, numerous mounds, subterranean works; and the expert in Indian lore would find our tree records, In-

\* American Antiquarian, Vol. 1, p. 113.

† American Antiquarian, Vol. 8, p. 38.

dian trails and village sites, etc., a paradise to him. There is a strong probability that Tampa is built, like ancient Rome, over the site of a long-forgotten city. Spanish Town Creek is an ancient artificial inlet; every old tree in the reservation was planted for a purpose, and bears the record of it; who will read and translate? Ballast Point has its breakwater and landings, and is rich in records. Port Tampa City covers the site of an ancient city. On the Gadsden peninsula are numerous excavations; there are trails of hard material across boggy marshes; trails to islands, trails to landings; and so many items of interest await the competent searcher, that Tampa might invite all the archæological societies in the country and keep them busy there for a considerable time."—*N. Y. Evening Post*.

While traveling in Ross County, Ohio, a discovery made fifteen years ago was brought to my attention. Four miles northwest from Yellow Bud, on a high terrace above Deer Creek, stands a large, steep mound. Some farmers sunk a shaft from its summit, and at a depth of twenty-six feet discovered a log pen 12 x 10 x 6 feet. In it were two skeletons, beads, pipes, etc. The ends of the logs show the marks of stone-cutting tools. The excavation is now partly filled with tree trunks, brush, etc., but one can get a glimpse of the upper tier of the logs. The structure should be thoroughly explored.

Skeletons and relics were found in a mound at Sioux City, Iowa. The report is very misleading and incorrect.

Near Le Roy, N. Y., a fine pipe and the bones of an Indian were found.

More mummies have been found in Utah cliff houses by a student from Pittsburg. It is to be hoped that the explorations which he carried on were scientific in character, and not mere ramblings in search of relics.

Carl Lumholtz in *Scribner's Magazine* for July, sets forth his recent discoveries among the living cave dwellers of Mexico. We quote as follows: "Are the cave dwellers related to the ancient cliff dwellers of the

southwestern part of the United States and northern Mexico? Directly not. Their very aversion to living more than one family in a cave and their lack of sociability, marks a strong contrast with the ancient cliff dwellers, who were by nature gregarious. The fact that people live in caves is in itself extremely interesting; but this alone does not prove any connection between them and the ancient cliff dwellers. Although the Tarahumari is very intelligent, he is backward in the arts and industries. His pottery is exceedingly crude, as compared with the work found in the old cliff dwellings, and its decoration is infantile as contrasted with the cliff dwellers' work. The cliff dwellers brought the art of decoration to a comparatively high state, as shown in the relics found in their dwellings. But the cave dweller of today shows no suggestion of such skill. Moreover, he is utterly devoid of the architectural gift which resulted in the remarkable rock structures of the early cliff dwellers. These people, so far as concerns their cave dwelling habits, cannot be ranked above troglodytes."

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Massillon, June 28, 1894.

*Editor of the ARCHÆOLOGIST.*

DEAR SIR—In last Friday evenings *Independent* (daily) of this place, I saw a notice that a human skeleton had been found in the gravel two and one-half miles south of this town. I made inquiries concerning it and found that it was only about three feet below the surface of the gravel. Yesterday it was brought to me, and although it may be a comparatively modern skull, it has some peculiarities that make it interesting. It is of a small-sized individual past the meridian of life, with the bones somewhat thicker than the average, and the ridges for the attachment of muscles large and well defined. The teeth are heavy and strong, but pretty well worn down. All were intact and perfect at the time of death. The lower jaw shows a well defined degree of prognathism, and the skull as to shape is

between the *dolicho-cephalic* and *trachy-cephalic* types, or *medio-cephalic*. At the *sagittal lambdoid suture* is a large wormian bone of irregular quadrilateral form, one inch in circumference. To the left of this in the *lambdoidal suture* is another about one-third as large as the one just described. Beside the skull only a few vertebræ and bones of the hands and feet were found, with a few fragments of ribs. They are in a fair state of preservation from the fact that a solution of iron had filtrated into them, staining them of a dark reddish-brown color, and in a measure preserving them from further decomposition. If this is a modern skull, it is very interesting from the fact that it presents so many of the salient characteristics of ancient crania. You may make any use of this that you may see fit. No implements of any kind were found.

DR. A. P. L. PEASE.

#### A NORTHERN OHIO VILLAGE SITE.

Some interesting prehistoric remains have been found about one mile east of the Mahoning County line, on the Palmyra and Milton Center road, running east and west on land owned by Artemus Lewis, of Cleveland. Here the river forms a horse-shoe bend, entering the farm from the south and leaving the farm and running south. The action of the water on the north and east has cut into the banks, causing them to cave down. In June, 1890, I noticed on the east side of this bend indications of former occupancy, such as charcoal, burnt stone, bones and flint arrow-heads, which were exposed by the caving of the bank to a depth of three feet below the surface. On May 28, 1894, I began an investigation.

We removed the surface soil, which has been plowed numerous times. We first found an ash pit as they are generally called, containing burnt stone, charcoal ashes, broken Indian pottery, the remains of a deer's head and neck and some corn, burnt black. We proceeded to dig over

a piece of ground 135 by 40 feet. As the work progressed 41 of the ashpits were found. They were of all sizes, from the size of a dishpan or a mere hollow in the ground to 3 x 6 and four feet deep. These pits were of great interest, as it was evident this was once the site of an ancient village, and the pits contained besides relics the remains of the daily meals of the people. In one pit of large size was found the remains of at least parts of three deer. Near the top the bones were very soft, but at a depth of twenty inches the bones were burnt from an amber color to black. Near the bottom of the pit the bones were well preserved. There were also the bones of fish, squirrel, birds, one large joint and numerous other bones not yet identified. This pit contained the only piece of pottery bearing any ornamentation, also another piece of a vase shaped jar nearly whole. This piece was of crude workmanship, thick and clumsy. The pottery was of two kinds, one of pulverized granite, the other of clay with pulverized shell. None of it was well baked or burned, and none was glazed.

It appears this site had also been used as a burial ground, as the remains of six bodies were found in the course of the work of digging. The first grave was a double one two and a half feet deep, with the remains of an aged adult, as is evident from the fact that the lower jaw contained but three of the incisors, one of which was decayed. It is evident that the remains were either placed in the grave head first or in pieces, as the skull lay on the left side facing the north and all the larger bones of the body lay directly above it. One limb stretched out to the north, the other doubled back at the knee.

Eighteen inches to the west of these remains was the skull of a young person in a poor state of preservation. This interment was covered with refuse similar to that found in the pits, with the addition of considerable burnt corn.

The remains of four more were found,

all in a poor state of preservation; one near the river bank, which burrowing animals had scattered through the soil for a considerable distance

In one case, that of an aged person, a very sharp flint arrow-head,  $2\frac{1}{8}$  inches long, lay close to the skull. In the lower jaw but one large molar tooth remained. The upper jaw was entirely gone, but several of the incisors were left, which were worn down to the roots; on one no enamel was left.

The relics found were mostly crude, and nearly all in the ashpits. They were as follows: One stone celt or hatchet; one stone ball two inches in diameter; one hammer stone; one cup stone; one piece of quartz crystal; one piece of red iron ore (burned); one piece of a slate ornament which had been broken and repolished where broken; 85 pieces of broken pottery, some of which were five-eighths of an inch thick and very coarse; seven whole flint arrow-heads and eighteen broken; one flint drill (broken); one flint scraper and numerous chips and flakes of flint.

In regard to the firepits or ashpits, it seems they were filled at different times, as the layers were in different stages of preservation. Some appeared to be so old that nothing remained but the charcoal, burnt stone and ashes. A large one had a few pieces of bituminous coal in the middle of it, while another had about a peck of river clam-shells, which were so much decayed they fell to pieces on exposure to the air. All bones of animals had been broken in all manner of shapes, also the antlers of the deer. All of the larger bones were broken off close to the joint, and the remainder split lengthwise, and often splintered up fine. Remains of the deer were most numerous. At least two-thirds of the pits contained them.

There is no tradition in regard to this place. So far as known it was never inhabited in historic times. The farm was cleared early in the century. The site is fifteen feet above the river, and is the brow

of the ridge sloping south to the bottom land. The length of the ridge is 1,050 feet running in an easterly direction. The place explored is 825 feet west of the Carson mound, which was explored in May, 1890, and which contained the remains of fifteen persons and relics of a similar character to this place.

The conclusion reached is that this was once a populous village. I will say here that none of the remains were of more than ordinary size, and nothing of modern character was found; nor any metals of any kind.

I wish to extend my thanks to the owner and occupants of the land for permission to explore, and also to my friends of Diamond for volunteer help in the work of excavating.

J. H. DAVIS.

Diamond, O.

### ✓ Cave Exploration in the Eastern United States.

Proofs not yet looked for have been examined in the Eastern United States to show how and when man first reached the Atlantic seaboard; whether, as the Indian found by John Smith and De Soto, he had come there in geologically remote times or whether, having crossed the mountains, as the Lenape alleges about 1370, he had found a region hitherto untrodden by human feet.

Granted that in America as in Europe, early man visited or dwelt in all large, well-lit and easily accessible caves, then it seems that if many races and epochs of culture have succeeded each other in the New World as in the Old, American caves, rather than surface sites of habitation should somewhere prove the fact. For there where rock walls and the limit of light and shelter would have forced every pre-historic cook to build fires and gnaw and throw bones upon the same spot, epoch denoting refuse layers would have been made, the oldest on the bottom and the latest on the top. If further in the search for such caves in America we may infer that those will tell



the most which have longest confronted the greatest number of primitive inhabitants; then it seems that *those besetting the mountain passes and river pathways by which early man must have first penetrated the great forest and crossed the Appalachians would likeliest contain the complete record of his presence.*

To realize this is to regard as of superior import the rock habitations and shelters opening upon the mid-continental waterway of the Tennessee, or that of the Ohio, which, with its easternmost reaching tributary, the Kanawha-New river, would lead a foot wanderer, the first comer let us suppose, at least pains from the Mississippi river over the mountains to the eastern coast. Many interior-lying shelters it seems might be eliminated from the search for the sake of a first look at caves like these, which half blocking so presumably ancient a footpath might likeliest have caught presence tokens from every race that passed that way. More than this, a long series of them by the river might well show the direction of migration by the increased number of layers or the greatest fossil age, of the man-gnawed bones, as we proceeded up or down stream.

That we were on a mountain pass of Archæological significance was soon apparent as we descended the rock-beset channel of the New River-Kanawha. The river-side village sites (examined at Ivanhoe and Flanagan's) often contained mica as we learned at Indian Creek, Cotton Hill and Summer's Creek, and the mounds midway in the mountains at Dunkard's Bottom, Little River, Madam Creek, Sandstone and Gauley, in the two instances examined, containing mica discs (at Dunkard's Bottom with an arrow-head cache, and at Hinton with a skeleton), were beyond all doubt the work of the builders of the Ohio tumuli, who had crossed and recrossed the mountains that way to get mica in North Carolina.

Leaving behind the Forge Cave (described in the *American Naturalist* for July, 1894), with its single geologically modern Indian

layer, and searching every rock fissure on the stream, "Thompson's Shelter" (under Castle Rock, 26 feet above water, left bank of New River,  $\frac{1}{4}$  mile above Pembroke Ferry, Giles County, Virginia), close edging the narrow and level path of the river migrant, with mounds and Indian traces above and below it, and 35 miles from Stewart's Cave, Greenbriar County, West Virginia, where Jefferson discovered the Fossil Sloth, seemed the chosen receptacle for all the proof we sought. But our trench (10 feet 7 inches long by 19 feet 3 inches wide, by 12 feet 8 inches deep), dug to rock bottom through (a) six inches of cave earth with charcoal, arrow-heads and glass (white man and Indian), and (b) eight feet two inches of hearths and ashbeds with bones, pottery and flint chips (Indian) showed no man-associated animal more ancient than black bear, wolf, grey fox, deer, raccoon, woodchuck, squirrel, rabbit, cave rat, wild turkey (numerous), duck, land tortoise, snapping turtle, catfish (frequent), snake, unio (three species) and triodopsus. The bones grew scarce and the pottery ceased as we dug below the fifth foot, but the intermixed sand showed that the river had been in the cave, and though there were isolated masses of charcoal eight feet eight inches down, there was no sharp line of distinction between them and the hearths above, or proof, in the absence of presumably older bones, that this lower refuse, occurring in the now purer sand, denoted an epoch geologically older.

Examination of many river-fronting cliffs brought us at length to the imposing sandstone rock shelter, known as the Buffalo House, 50 miles down stream (right bank of New River, Summers County, West Virginia, at mouth of Laurel creek, 23 feet above it and 405 feet from the river, with two mounds  $\frac{1}{4}$  mile from its entrance). There the evidence at Thompson's was repeated in a trench 8 feet wide, 20 feet long and 11 feet deep, dug down to formidable masses of fallen sandstone. It showed (a, 1 foot) dust, bones, Indian remains,

nails and glass (white man and Indian), and (b, 5 feet) a series of hearths mixed with bones, pottery, arrow-heads and chert chips (Indian), resting on a substratum of roof splinters through which charcoal had trickled to a depth of 11 feet, and containing the remains (kindly identified with all the other bones and shells by Prof. Cope) of the bear, panther, deer (very common), squirrel, rabbit or rodent, land tortoise, turkey, bird (undetermined), snail, unio (two species), perriwinkle and walnut. Again we had missed all trace of an earlier age of man-devoured animals, while the human relics were those of the pottery-making Indian of the Forge Cave, of Flanigan's midden heap, and, it seemed, of the mica miners of Hinton's Mound, ten miles up stream.

Below the Buffalo House mounds on distant hills still followed the river's course, but the valley narrowed into an impassable gorge, which still traceable Indian trails had avoided by a long detour, and where for fifty miles a man could not have walked along the stream. This change in the valley weakened the force of deductions from our excavations, for important as the Trans-Appalachian pathway still seemed, trodden as it had been by the marauding Indian and by the mica-hunting builder of mounds, the first comer, older possibly than either, confronted by this obstacle of the gorge, might have turned back and crossed the mountains another way. The Mule Pen sandstone shelter, fronting this forbidding chasm (left bank of Kanawha, 63 feet above the river,  $\frac{1}{2}$  mile below Kanawha Falls), did not surprise us with the scantiness of its human remains. There our trench, 8 feet broad, 10 feet long and 5 feet deep into undisturbed yellow clay mixed with pebbles and coal showed (a, 1 foot) glass, nails, arrow-heads, chips and pottery (white man and Indian), and (b, 1 foot) charcoal, pottery and arrow-heads (Indian), containing the sparse remains of deer and two species of unio.

Once past the Kanawha gorge, the midden and mound-marked shores of the broadening valley betokened that the tide of early

habitation had returned to the river, and we saw the pleasing lawns by which a man might walk unhindered from Charleston, West Virginia, to the Mississippi, but the absence of caves in the low sandstone bluffs, where many ravines were faithfully explored, deprived us of that record which would have availed more there than anywhere else. A large midden heap examined at Macker's Station (right bank of Ohio river, 6 miles above the Kanawha's mouth), containing the bones of man, bear, grey fox, dog, elk, calf, opossum, raccoon, turkey, soft-shelled turtle and unio (seven species), might or might not have been left by the builders of the neighboring earthworks at Marietta, Grave Creek and Charleston, and its still existent fauna added nothing to the evidence of an ancient occupancy.

Henceforth for 200 miles the wooded sandstone ridges edging the Ohio lacked the cave evidence we wanted. In vain we halted for information by the gentle slopes, in vain examined many ravine-hidden shelters, dampened by cataracts, until the Falls of the Ohio at Louisville were passed. There again entering a limestone region, we reached the conspicuous, but scarcely accessible, Boon's Cave (right bank of Ohio, three miles above Bradenburg, Harrison County, Indiana). But its single surface film of Indian refuse proved little, and we went on chagrined at the limestone river caves which, generally opening from well-like sinks, were damp, dark and unfit for human habitation. After penetrating an Indian layer containing deer, raccoon, rabbit, rodent, turkey, land tortoise, fresh-water drumfish, catfish, snail (*Mesodon* and *Anguispina*), at Alton Rockhouse (right bank of Ohio, one mile below the mouth of Little Blue River, Crawford County, Indiana), our work was interrupted by the owner, and leaving with disappointment the broken record, we turned down the river to reach at last the once celebrated robber den, well known to flatboatmen and pilots as Cave-in-Rock (right bank of Ohio river, thirty miles below Shawnee town, Hardin County,

Illinois). But at this most conspicuous shelter on the Ohio river, freshets had washed out our evidence, leaving upon the cave floor the mixed remains of an Indian stone box graveyard and midden heap, which had fallen in through a sink-hole from the hill above. Meanwhile, our examination of the twenty-three miles long Wyandotte Cave, Crawford County, Indiana, proved that Indians had carried carbonate of lime from the "Alabaster" quarry observed by Mr. Collet to the torch room nearly two miles away underground, and that to light their flint mining work, discovered by Mr. Hovey in the "Pillared Palace," they had used torches, as proved by my experiment, of hickory bark.

These were new facts for Archæology, as was the discovery of another source for the nodular flint blades of Ohio mounds at a worked deposit of the native rock (two miles southwest of Brandenburg, Meade County, Kentucky), and the study of cave burial at Peckenpaugh's cave, where human bones, along with charcoal, deer, rodent and unio scattered the surface of a small underground chamber, only accessible by rope from above. But as these caves were out of the river way and unsuited for habitation, their study, however instructive, added nothing to the main object of search, and left us with the lake and Morgan Rock shelters (left bank of Ohio, under Jeffrey's Rock, three miles from the river and four miles above Hawesville, Hancock County, Kentucky), as our last available test for the antiquity of man on the lower Ohio. At Lake's Cave our trench, 14 feet long by 10 feet wide, by 2 feet 7 inches to 5 feet 6 inches deep, reaching bands of pure stratified sand and clay, with water at five feet, revealed no great antiquity for the midden heap (containing the remains of man, wolf or dog, ground hog, rodent, raccoon, deer, turkey, land tortoise and unio) where the cave occupants had buried two dolicocephalic skeletons, with decayed teeth and jaws perforated by abscesses, in crouching positions against the inner wall. At Mor-

gan's Cave the single Indian layer on a projecting ledge, with its remains of raccoon, deer, rabbit, turkey, bat, bird, lizard, unio (two species), honey locust, butternut, pig-nut, acorn, hickorynut, corncob and chestnut burr indicated no great antiquity, and proved no predecessor for the cave inhabitant of the surface. Still, these latter shelters, though of grand dimensions, were obscured by trees, and removed as they were from the river, could not, with their doubtful water supply, be regarded as important evidence against the existence of a geologically ancient people on the final westernmost reach of the great water path.

Our expedition now ended of 600 miles down an important route of ancient North American travel, by way of the once chilly haunts of alleged Paleolithic Men in Ohio and Indiana, and through the preferred territory of the "Mound Builder," had failed to find cave-buried traces of any pre-Indian wanderer. But, striking as this fact was when all is summed up, it was not so striking as the absence in our cave-cut trenches of underplaced remains of the older animal inhabitants of the region. The fossil sloth, the mastodon, the giant chinchilla, the horse, the reindeer had been thereabouts before the epoch of the midden heap fauna unearthed. But where were they? Had they never come into the caves to die? Had carnivora never dragged thither their carcasses? Or had freshets washed away their once deposited bones? To account for the absence of such fossils was not easy, as we dug downwards, unless we supposed, which was possible, that the man-selected shelters examined by us were too open and too light to serve, like the "bone hole" at Port Kennedy and Hartman's Cave in Pennsylvania, as the chosen dens or tombs of animals.

Grateful acknowledgment is here returned to Mr. C. Howard Colket, Mr. Charles C. Harrison, Dr. Daniel G. Brinton, Mr. Stewart Wood, Mr. Charlemagne Tower, Jr., Dr. Horace Jayne and Mr. Edwin Balch, whose generous contributions have

rendered possible the expedition. As before, all the animal and vegetable remains have been identified by Prof. Edward D. Cope, to whose kind co-operation and assistance I owe continued thanks.

H. C. MERCER.

Aldie, Doylestown, *July 4, 1894.*

Mancos, Colo., *June 24, 1894.*

*Editor of THE ARCHÆOLOGIST :*

DEAR SIR—Replying to yours of 12th inst, in regard to late discoveries made by us, we will herein give you a short account of the part of our work referred to.

In the fore part of April we worked out what was known as Snider's Well, and made the discoveries which seemed new to so many people.

Mr. Snider lives on a long, narrow ridge, southwest of Aztec Springs, near the site of the large ruins in Montezuma County, Colorado.

On this ridge are many circular depressions in the surface of the ground. Many persons suppose them to be reservoirs. We having worked out so many of them knew they were estufas.

In one of these Mr. Snider had started a well. At the depth of ten feet he found human bones, but kept on digging, until he dug through two or three feet of them; he then began to realize that they might be of some scientific value, and quit work until we returned from Utah, where we had been exploring during the winter.

Our first work was to make a circle 21 feet across, on the surface, by digging down from the line of the circle. The walls were found at a depth of eight feet. By carefully working out the dirt on the inside of the wall, we were able to leave the plaster or mud in position on the wall, seven thicknesses of which we could make out, each of a different color, four of which being—first red, the natural color of the earth, second white, third green, fourth a red ochre.

The room itself is circular, having a wall one foot in thickness and two and one-half

feet high, with eight pillars on top two feet high, and equidistant. A circular wall connecting the back of each pillar, and forming a shelf or recess between each pair.

These pillars at one time supported a sixteen-sided conical roof, with the entrance in the top. (Some remains of the timbers were still on the floor.)

The fire-place is a circular hole eighteen inches in diameter and one foot deep; is in the centre of the floor; between it and the outside wall is what we call a wind wall, which is a short wall four feet long and two feet high. This wall stands squarely in front of a square opening in the outside wall. This passage way we did not dig out, but it has since been explored to a length of twelve feet. Usually these passage ways do not extend more than six feet before turning toward the surface, making a right angle.

At a depth of ten feet we came upon a mass of skeletons that had originally been thrown into the room in a haphazard manner. All of the skulls saved had each a hole in it such as would be made by striking it with a stone axe. Of twenty-five specimens examined, all proved to be of the cliff dwellers' type, having the perpendicular flattening at the back of the head.

The skulls from the regular burial mounds in the vicinity have the oblique flattening upon the back of the head, showing there must be some distinction in the races.

We infer from this discovery that these skeletons must have been prisoners or captives killed and thrown in this estufa.

More work should be done in this particular vicinity to determine the relations between these pre-historic people.

Mr. Stafford, on whose land the large ruins are, has kindly offered to allow us to select any spot we may choose to do this work, and give us the finds, whatever they may be, but as it requires considerable capital to carry on the work, we will have to postpone it until some future time.

The credit of the work already done belongs to the gentlemen who have furnished



us with the funds for our explorations, and they are Messrs. Baldwin, Hyde and McNeely.

Truly yours,

RICHARD WETHERILL.

Riegelsville, Bucks Co., Pa.,

June 18, 1894.

Editor of THE ARCHÆOLOGIST :

DEAR SIR—For many years a practical collector and student of pre-historic art, I am surprised to find here and there earnest, and we believe honest, non-believers in Paleolithic Man. When, however, a collector has spent almost a lifetime in careful, thorough and scientific investigations in this line, and has found rude relics deeply covered by pre-moraine gravels, and in a geological position denoting great age, archæologically speaking, we cannot but come to the conclusion that a type of man existed during the aeons of the past, leaving a few scattered mementos.

Taking into consideration the numerous implements discovered by us on the surface or deep underground, we must say that only implements of the rudest type were unearthed deep underground. If the uprooting of trees, as some claim caused the burial of these rude, and only the very rudest kind, of implements, nature must have been very discriminating, as we never yet found any polished implement at a greater depth underground than three to four feet in pre-moraine gravels, but have found polished, as well as rude implements, in post-glacial gravels at various depths, say from six to twenty or more feet. As regards the uprooting of trees in pre-moraine or any other gravels, and we have seen thousands of such, we have thus far failed to find the soil broken up to a greater depth than four feet, and in the majority of cases not over three feet; and besides this, why would only rude implements become buried in pre-moraine gravels to a depth of twelve to twenty feet, while both rude and polished are found on the surface. The rude, however, are

found very sparingly on the surface, as well as underground, in these deposits.

It would seem as if only rude implements become unfortunately hurled to great depth in a manner to mislead students of Paleolithic Man. This we cannot believe: Nature is ever truthful, and in its evolutionary efforts speaks in no uncertain language. Nor can we believe that a blank of uncertain length existed between the Paleolithic and Neolithic ages, for the reason that we find an occasional rude implement on the surface, as well as mixed through the pre-moraine deposits; but as noted above, in no instance have we found a jasper implement in these gravels at a greater depth than seven feet.

In all probability a rude type of man existed during pre-moraine times, and were driven southward by the great ice sheet; and again during its melting while a new climate dawned, he rapidly increased in brain capacity, evolving new ideas, thereby creating new wants and necessarily improved implements. Similar to the evolution of man of the present period—constantly improving in mental capacity; evolving new ideas and creating new methods :

1st—In summing up we find no necessity to doubt the existence of Primitive Man.

2d—We see no necessity for creating a hiatus of uncertain length between the Paleolithic and Neolithic periods.

3d—As to Glacial Man having evolved to the status of making pottery remains to be proven.

4th—Much has been said to the effect that even if the Drift Man had pottery, it could not have survived; gravel washing would have destroyed it. In our experience we found numerous delicate fossils that survived the ordeal.

The foregoing is simply our position, and we do not intend any disrespect to those holding opposite views. We can't all see alike, but when we find so many pointers to a type of man, however low in mechanical development, we are compelled to believe that such a man existed during the more recent geological disturbances, or soon after.

CHAS. LAUBACH.

### The Brooklyn Meeting of the American Association.

(August 16th to 23d.)

We received the clippings from the New York papers concerning this meeting as THE ARCHÆOLOGIST was going to press. The review of the work done will necessarily be brief.

The attendance was about 800, an unusually large number. The papers read before Section H (Anthropology) were numerous, there being 142 presented, and about one-fourth of that number read. The New York and Brooklyn people did much for the Association, giving excursions, receptions, etc. The best citizens of both cities were out, *en masse*. Much interest among the wealthy class was stirred up, and as a result, the Association may expect contributions toward the exploration fund.

The papers published very amusing sketches of noted scientists. Those in the *World*, of Professor McGee, explaining primitive trephining, of Dr. Brinton on "Variations in the Human Skeleton," were especially good. The illustrations were very funny caricatures.

One of the most important lectures was delivered the night of August 20th in the Academy of Music by Professor E. D. Cope. The subject was, "The Relation of the Human Structure and Physiognomy in Comparison with that of other Mammalia." Other papers were: "The Valley of the Yucay, or, the Garden of the Incas," G. A. Dorsey; "The Salt of Savagery," F. H. Cushing; "Some Indian Fishing Stations Upon Long Island," W. W. Tooker; "The Ceremonial Year of the Maya Codex Cortesians," M. H. Saville; "The Ideal Museum," Thomas Wilson; "Corean Children's Games," S. Culin; "An Illinois Drift Implement," Dr. J. F. Snyder.

We have not room to mention other papers of value. No discussion of special importance occurred in the section. Dr. Le Plongeon challenged Dr. Brinton to a discussion upon the Mayas. It seems that

Dr. Le P. feels slighted because a former paper of his was not read before the Association. The next meeting will be held at San Francisco.

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Durand, Wis., August 11, 1894.

Yes, Mr. Van Epps, the fools are not all dead. I know of two aged persons living within five miles of my home who possess what they call "thunder stones." They claim wonderful curative qualities for these stones—as miraculous as the cures performed by the Holy Coat. I have tried to buy the relics several times, but without success. The stones are grooved axes of high polish, and weigh two pounds each.

I have a large collection, gathered in my neighborhood—spades, pipes, knives, slate relics, spear and arrow-heads, etc. My collection is largely for the benefit of our school children, and they take a great interest in it.

There are very many mounds near here. The average size is five by twenty-five feet.

ISAAC D. ALKIRE.

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An interesting paper will be presented the readers of THE ARCHÆOLOGIST in October or November. It treats of, "A Comparison of Ancient and Modern Village Sites in Ohio," and is the result of extensive field work upon the part of the Department of Archæology of the Ohio State University.

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### EXCHANGE DEPARTMENT.

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Exchange notices pertaining to Archæology, not exceeding 35 words, will be inserted free for all regular subscribers. Dealers are referred to our regular advertising rates.

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Wanted—Flint hoes and spades, also hammers and discoidal stones, for which I will give Indian relics, war relics or cash. T. B. Stewart, Lock Haven, Pa.

Flint arrow points and copies of THE ARCHÆOLOGIST to exchange for old U. S. and Columbian stamps. Geo. O. Greene, Box 41, Princeton, Ill.

# THE ARCHÆOLOGIST.

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WATERLOO, INDIANA, OCTOBER, 1894.

No. 10

## THE PLUMED SERPENT IN NORTHERN MEXICO.

MARSHALL H. SAVILLE.

HAVING had occasion to examine a large collection of archaeological material from Northern Mexico, now in the American Museum of Natural History, it seems proper to note the occurrence of the plumed serpent, associated with the Quetzal, in the region between the country formerly occupied by the Nahuatl speaking people, and that occupied by the Zuñis and Moquis.

Under the floors of ruined adobe houses near the ruins of Casas Grandes, in the State of Chihuahua, Dr. Carl Lumholtz found a large number of pottery vessels frequently associated with human skeletons. On one of these vases is depicted a serpent extending around the side of the vessel. Projecting above the head, near the mouth, are two plumes, as seen in Figure 1. The cut simply shows a portion

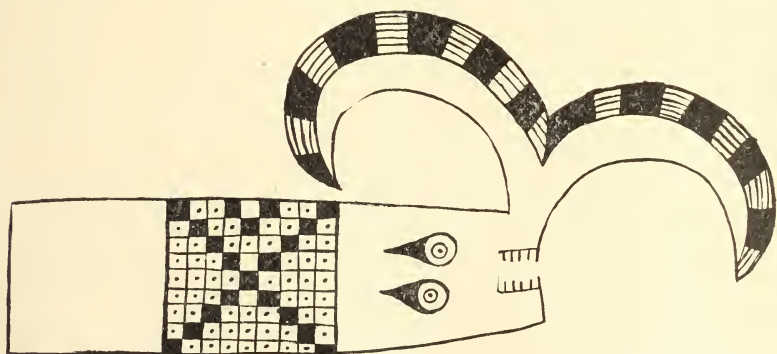


Fig I.

of the serpent, the body being bent up and down in four parts. The ornamentation alternates between the checkered pattern and plain squares, painted terra cotta. It will be observed that the two eyes have been painted on this side of the snake's head. The tail ends in a conventionalized manner strongly resembling the Moqui rain

symbol. Above the serpent, near the rim of the vessel, are two birds, one of which (Fig. 2)\* is characterized by a toothed triangular ornament (a Moqui symbol) on the side of the breast, and with two circles around the eye, the other bird having only one eye. These marks may indicate the more brilliant plumage of the male bird.

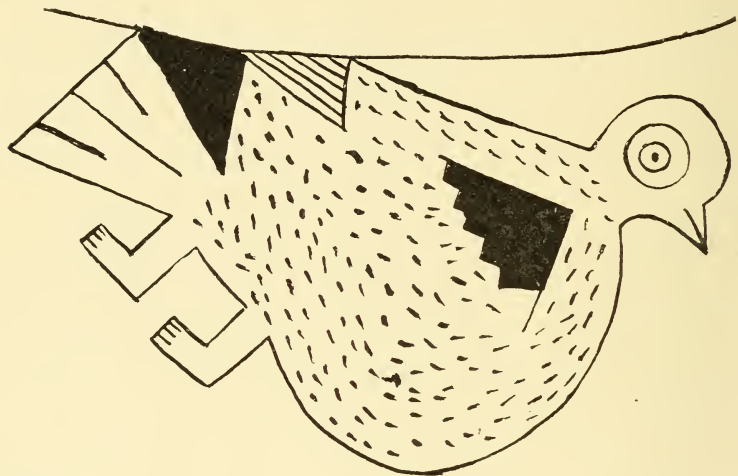


Fig II.

Although conventionalized, these birds have several characters of the *Trogon Mexicanis*, whose habitat is Northern Mexico, in the arched head, sharp pointed beak, puffed breast and prominent tail, the upper part of which is turned over to accommodate the figure to the rim of the vase.

This vase is superior in quality and decoration to the pottery of the ancient Pueblos, although the angularity of the design strongly suggests the Arizona and New Mexican type. It is the finest specimen of a number of the same general character, and several others have the bird and serpent forming the decoration. This symbolism occurring in Chihuahua is of great interest, as it furnishes another connecting link between the culture of New Mexico and Arizona and that of the more advanced peoples of Mexico and Central America.

The worship of the feathered serpent was wide-spread in Central America, both among the Mayas and Nahuatl, and the Moqui snake

NOTE.—\* The curved line above the bird represents the top of the vessel.



dance, which is about to be described for the first time in its entirety by Dr. J. Walter Fewkes, undoubtedly has its prototype among the ancient inhabitants of southern Mexico.

The combination of the bird and serpent on this vase may possibly be an ideograph, Quetzal (bird), Coatl (serpent), indicating the use of the vessel in ceremonies pertaining to the feathered serpent god. If so, it is doubly interesting as indicating the degree of culture attained by the old race inhabiting the valley of the Rio Casas Grandes.

## THE PICTURED ROCKS OF BOONE COUNTY, MO.

WALTER H. FICKLIN.

THE country about Rocheport, Mo., abounds in interesting features, and not least among them are the high cliffs, great caves, natural springs, Indian remains, etc. Four miles southeast of Rocheport, on the farm of Mr. Torbett, is a limestone bluff over one hundred feet high and extending a quarter of a mile along the Missouri River. This bluff is overhanging in most places, and from a cavernous opening in its surface gushes a large spring, which pours in a series of leaps into the river thirty feet below. At the north end of the bluff is the opening into a cave over a mile in length. There are several very large mounds on the hills in this vicinity, and the abundance of the flint flakes and other remains prove this place to have been a resort of the Indians. Probably what most attracted them were the abundant supply of good water, the cave and numerous other hiding places, and the altitude of the bluffs and hills, which permits a view of the country for miles in every direction.

Fifty feet above the spring are some rude drawings, together with some sort of hieroglyphics made on the surface of the rocks. Here the top of the bluff overhangs some ten feet, and protects a part of the surface which would otherwise be subject to great erosion, and this circumstance is one that accounts for the preservation of the pictures to the present day. Formerly, all along the surface under the projecting ledge were the remarkable representations, and at the height of fifty feet directly over the spring was the largest visible group. About two years ago most of the pictures were jarred off the weather-beaten bluff by the blasting necessary in the construction of the M., K. and E. Railroad.

All the drawings that now remain are a few directly over the spring and two about one hundred yards up the river. They comprise four rude drawings of human figures, one about thirty-six inches in height, the others from twelve to twenty-six inches high. One of the small figures represents a man wearing a hat and carrying a staff. There are also three circles, one with a dot and cross in the

center; one large round spot within a crescent, and another figure resembling a man but having horns. The group up stream consists of an elephant and a wild turkey, each about a foot high. All the figures are now very dim, and are very easily overlooked. The writer failed to detect them till they were pointed out.

About five feet below most of the figures runs a narrow ledge, on which the artist or artists must have stood when the pictures were made. The ledge is reached from points east and west, but it requires a person of some courage to climb it. Some of the figures, however, are fifteen feet above the ledge, and could not have been made without a ladder of some sort. The drawings seem to have been made of a red paint, composed probably of powdered hematite mixed with water or grease, and applied with the fingers or a rude brush. A portion of the surface of the cliff is covered with ivy, and not all the pictures can now be seen. Who the artists were that sketched these pictures, and what, if anything, they represent, can only be conjectured now.

An approximate estimate of the age of these figures may be made by referring to the pictures of the elephant and the man wearing the hat and carrying the staff. They both prove conclusively that they were made since the first white man settled in America. Europeans first made their appearance in Missouri either in De Soto's wanderings in 1543 or in Marquette's expedition in 1673.

Wm. F. Switzler, in his "History of Boone County," says that these paintings were seen by Lewis and Clarke in 1804. I have seen only an account of the Lewis and Clarke expedition; although some paintings are mentioned, there is not enough said to easily locate them. The following is an extract: "The next day we passed at four and one-half miles Big Manitou (Moniteau) Creek, near which is a limestone rock inlaid with flint of various colors, and embellished, or at least covered, with uncouth paintings of animals and inscriptions."

The pictures I have described are four miles below the mouth of Big Manitou Creek, and there are some about a mile above, but the mouth of Big Manitou is twelve miles above the mouth of Roche Perche Creek, three miles above which the party camped the night before the discovery of the paintings, and the four and one-half miles mentioned above would bring them to the bluff on Torbett's farm. I, therefore, think it probable that these figures are those mentioned, and they must have been made sometime prior to 1804.



## PRE-HISTORIC POLYNESIA.

ELSDON BEST, WELLINGTON, NEW ZEALAND.

THE study of human antiquities is one which seems to possess a singular influence over the minds of thinking men, inasmuch as the deeper one goes into the subject the more entrancing does it become. An archæological friend has assured me that he would rather pick up a stone axe than a \$20 bill, and I can quite understand the feeling which prompted the remark. No one who has become interested in this elevating study can forget the keen delight felt while delving into a pre-historic midden or exploring some old-time ruin of a long-forgotten people.

It is but natural that antiquarians of the Old World should be so confined to their own hemisphere in their various studies, not only on account of their having some of the most interesting relics of ancient races in their midst, but also from the fact that many of such relics are of easy access, and, moreover, were the work of nations whose energy and culture have had a great influence on the various European nations.

The remains of ancient peoples found throughout Polynesia have not, as yet, attracted great attention, with the exception of those of Easter Island, which are probably of American origin. This, no doubt, is owing to the fact that no detailed or scientific description of such remains has yet appeared, the brief notices upon them which we possess being either the results of a hasty examination or are descriptions obtained from men of inferior education, and who took but little interest in the subject.

For the knowledge that we possess of these matters, to no one are we more deeply indebted than to the late Mr. H. B. Sterndale, of Polynesian fame, who has done much to place on record the results of many years traveling throughout the wildest and least known portions of the great island system.

It would appear, from the evidence of missionaries, traders and others, that there is no land in the vast extent of Polynesia but bears evidences of human occupation. On rocky, desolate islands, on small atolls, destitute of fresh water and food products, in the most forbidding and sterile localities, are found signs of the far-reaching Polynesians, those wonderful navigators of old who sailed the wide ocean over and established themselves from Madagascar to Easter Island, and from Hawaii to New Zealand. In those lone places are found huge caverns of stone and cyclopean walls, many of them buried in sand and drift, or under many feet of guano, stone axes and old wells, these last being sometimes hewn out of the solid rock, as on Pitcairn Island. On Suwarrow Island, eastward of Samoa,

human implements have been found eight feet below the present surface of that jungle-covered land.

Archæologists are divided in their opinions as to the use these ancient works were put to. From their peculiar structure and position no definite conclusion can be arrived at. Philological evidence, however, throws some light on the subject. These structures which, in Southern Polynesia consist principally of immense platforms or terraces, as those of Easter Island and Marquesas, and others in the form of truncated pyramids not unlike the *teocallis* of Mexico, are generally known as *marae* or *paepae*. These two words bear much the same meaning, namely, a sacred place for worship, burial or sacrifice. It may be inferred from this that these colossal structures were used in connection with the religion of the builders.

The stone terraces of the Marquesas are built on hillsides, each terrace being about 100 yards in length and about twenty yards in width. Many of the stones of which they are constructed are of great size, being from ten to fifteen feet in length and five to six feet thick. These stones are smooth, and although square, yet they bear no sign or trace of any implement. They are laid together without cement, as is the case with all these pre-historic remains of Polynesia. Huge trees are growing upon these terraces, their roots having penetrated between the stones, and their closely interlaced boughs and luxuriant foliage ever keep these ancient works in a gloomy and funeral darkness. It is difficult to conceive how a savage people, ignorant of the use of metals, could have shaped these stones and moved such ponderous masses into position.

The *marae* of Pappara is another immense structure, consisting of ten platforms, the first being six feet in height and the remainder five feet; the dimensions of base 270 feet by 94 feet, and the top 180 feet by six feet, the stones being mostly square. Other *maraes* of this kind in Tengtapu are likewise formed of colossal blocks of stone, many of them being 24 feet by 12 feet by 4 feet.

In Upolu of the Samoa Group, are also found relics of these ancient stone builders. One of these is an ancient cromlech situated on a mountain range some 2,000 feet above the beach level. It is composed of blocks of basalt some twelve feet in length, and it appears probable that in former times these upright pillars were connected by other stones being laid horizontally upon their tops. In the centre are two very large pillars standing alone.

Another mystery of Polynesia are the singular stone buildings on Rapa Island. Some of these, situated upon the hill tops, are in the form of platformed pyramids, and are of remarkably solid construction. The stones of which they are built are well squared and of great size. The absence of protective walls in these places seems to prove that they were not used as forts. Whether they were temples or places of sacrifice will probably never be known, but there they stand, ancient beyond dispute, unknown and imperishable.

In New Zealand no evidences of a stone-working people are met with, our archæological researches being confined to the exploration



in the kitchen middens of the ancient moa hunters, who were an early migration of the great Polynesian race which occupied this land many centuries before the arrival of the Maori in the historic canoes about the fourteenth century.

The two great fields for such antiquarian researches in Polynesia are, undoubtedly, Easter Island and the Caroline Group. The pre-historic remains of the former locality differ widely from those of any other part of the Pacific. Among other works of a non-Polynesian form are huge stone statues of human shape, possessing features unlike those of any race of men now inhabiting the islands of the Pacific. Somewhat similar to these are the great stone monoliths of Summatra, which are attributed to mythical beings who wandered over the land and turned their enemies into stone.

## OJIBWA IN THE SAGINAW VALLEY, MICHIGAN.

HARLAN I. SMITH.

IN the vicinity of Saginaw, Michigan, there are several settlements of Ojibwa Indians. These would hardly be called villages in the general sense of the word, but are mere collections of huts and houses. At one of the settlements about eighteen miles, by the road, south of Saginaw, these people have a church and also a burial ground, but they have no stores. At a settlement about eight miles northeast of Saginaw, one of the private houses is used three times each Sunday for religious services. Other than these meeting houses, which form *nuclei* for the settlements, they present few points in common with our villages, but resemble more nearly a cross-road collection of "small farm" houses.

These Indians shave out axe handles, whip-stocks and hoops for sale. They also make a large number of baskets of various kinds. These occupations, together with products of their small farming, day's labor, hunting, trapping and fishing, gain for them a fairly good livelihood.

Some of the forms of weaving and basket work which they once used, have become so neglected of late that but few of them remember the process, they having somewhat changed their basket work in order to cater to the taste of the whites, to whom most of these baskets are sold.

Their religious ideas are allied to the Methodist creed. Their services are extremely simple and sincere, and are attended by a large proportion of the individuals. They sing in a very pleasing manner hymns which have been put to their native tongue. Perhaps, on the whole, their morality is equal, if not better, than that of the average of their white neighbors. They are certainly much more polite and respectful than the ordinary woodsman living adjac-

ent to them. Many of the individuals, especially the younger people, wear the European costume ; however, some of the older individuals still wear the moccasins and other apparel typical of the native American. The squaws usually carry their babies upon their backs, held in place by a shawl drawn tightly around the shoulders.

The little boys play with the bow and arrow, and some of them have become so adept in its use that they even go hunting ducks and other similar game with considerable success.

In the early summer these people sometimes examine the mud in the bottom of the ditches and streams with a sort of crude spear in search of turtles. It is not an uncommon sight to see dressed turtles hung up near their houses along with dog-fish and other game, while the turtle shell is rather an ordinary piece of rubbish about the settlements.

Some of their houses are very well made, and fully equal to the houses of the whites living in the country near them. Others are fairly comfortable log huts, and some are merely piles of logs and boards resembling a "lean to." Some of these houses have hung upon the wall mats made of rushes, while near at hand are bundles of large splint baskets ready to be carried to market.

An endeavor is being made to study the Ojibwa in the vicinity of Saginaw ; to photograph them engaged in their various occupations and in groups, as well as to record their features by taking full face and profile views of them. They have many tales and traditions which relate to the early history and pre-historic earthworks of the Saginaw Valley, and it is hoped that a further study of these interesting people may lead to a better understanding of some of the remains in the valley. Here will also be an opportunity to note the influence of the missionary teachings upon the religious ideas and folks-lore of another race.

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## PRE-HISTORIC MAN IN UTAH.

HENRY MONTGOMERY, M. A., B. SC.

(Continued.)

OF the many aboriginal remains in the valleys, cliffs and mountains of Utah, up to the present time I have explored thirty-three cliff and peak structures and also many ruins of the people who occupied the valleys, and from them I have made collections of considerable magnitude and importance. There are altogether about five kinds of structures or enclosures, namely :

1. The rectangular adobe-walled house with simple or complex floor, rooms, wooden and adobe roof, and often plastered walls;

2. The adobe, stone and wooden house in a large, natural cave in the face of a cliff;

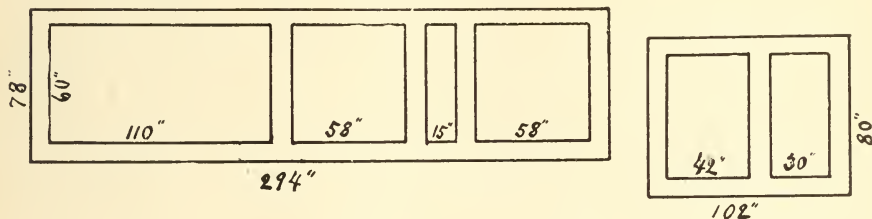
3. The artificial cave house, consisting of a small cave artificially cut into the face of the cliff, and made to serve the purposes of a building;

4. The small, natural cave, either with or without artificial additions of adobe and stone; and

5. The circular or semicircular structure composed wholly of stones, and reared upon the summit of some lofty peak or other greatly exposed place. There are, of course, varieties of all; but the above named five classes of houses are quite marked. In some places the valley house ruins are so numerous, and are situated so near one another, that they may be regarded as the ruins of towns or cities.

#### JUAB VALLEY RUINS.

One of these groups of remains was discovered by me in Juab valley not far from the foot of Mount Nebo, about eighty miles south of Salt Lake City, in the autumn of 1890. Since that time I have done considerable work in the way of opening and exploring this group of ruins, which I have named Mason City in honor of Prof. Otis T. Mason of the United States National Museum. There is here exhibited a photographic view and a ground plan of the walls of houses which I found beneath the surface of the



*Fig. 2.—Plan of Houses in ancient Mason City, Utah.*

ground in one heap of the aforesaid ruins in Juab valley during the months of May and June, 1892. These walls, when uncovered, were found to be perfect and unbroken, and although made of very large adobe bricks of irregular form, the walls themselves were smooth and regular throughout. They were utterly devoid of windows, doors or other openings. The floors consisted of two layers of adobe or mixed clay, separated by a layer of gravel, and the roofs, which had been made of poles overlaid by soft adobe or cement, had long ago fallen or been thrown down upon the floors, and since then the whole ruins had been buried beneath much wind-blown accumulations of dirt. One of these two houses was altogether about six and one-half feet wide and eight and one-half feet long, and it contained two compartments or rooms. The other house was six and one-half feet wide and

twenty-four and one-half feet long, and contained four compartments, respectively nine feet, four feet ten inches, one foot three inches, and four feet ten inches, from east to west, both houses being placed nearly end to end, almost in a line with each other, and almost exactly in an east and west direction. The largest room was five feet wide by nine feet long; each of the other two rooms was four feet and ten inches wide by five feet long, and the remaining room was but fifteen inches wide by five feet long. So also in the smaller building the rooms or compartments were very small, being two and one-half by five feet, and three and one-half by five feet, respectively. These two structures or houses were completely covered over



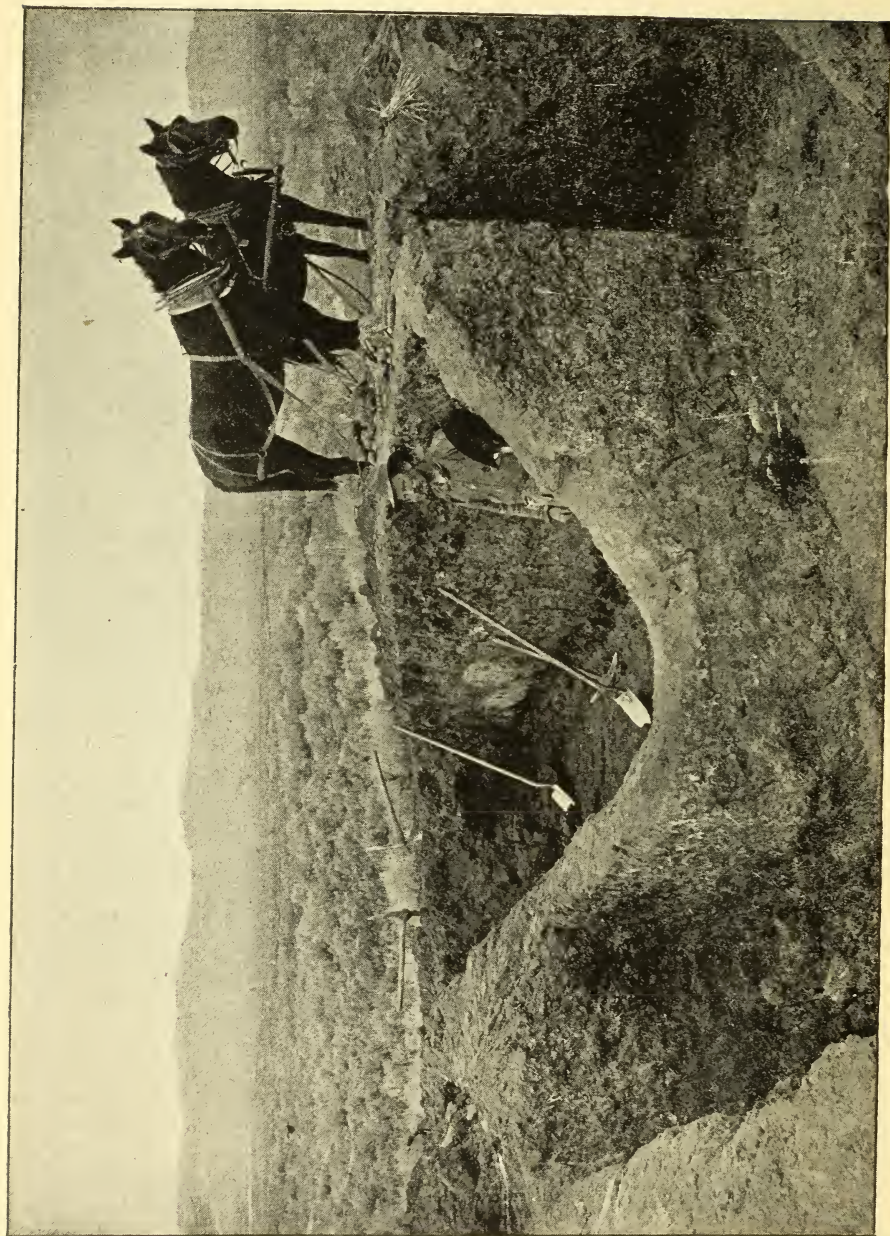
Walls of house containing four rooms, in the ancient Mason City, Juab Valley, Utah.  
Explored by H. MONTGOMERY, in June, 1892.

by one enormous heap of earthy deposits in the form of a mound about fifty feet in diameter and six feet high in the center, which was its highest part. Before the work of excavation was commenced this whole mound was nearly circular, and externally it bore a strong resemblance to the carefully built burial mounds of the Dakotas, Minnesota, and the adjacent "mound-building" country. This resemblance, however, was only external, as the exploration of its interior revealed the existence of two houses instead of burial chambers. The walls of these houses were about three feet in height, and all reached the same level. Many bone articles, chiefly



awls, and some charred corn cobs and charred wood were found in the rooms, as well as many pieces of broken pottery, and one perfect and well-formed jug of earthenware provided with a handle and an ornamented neck. This jug or pitcher was found in the largest room of the larger house. Among other things a large basalt stone *metate*, or corn-grinding mill and its grinding or rubbing stone, were taken out. This *metate* and its rubbing stone weigh about eighty pounds. A photograph of them is reproduced here. They are made of dark gray volcanic rock, which occurs in great abundance in Millard and other counties of southern and central Utah. Because of the porosity and roughness of this rock, the bottom of the *metate* is always rough enough for grinding purposes. It does not, therefore, need frequent picking with a pointed stone implement to keep its concave surface rough, as is the case with the sandstone, quartzite and other rocks employed as *metates*.

In the same city or series of ruins other similar structures have been uncovered and explored by me. One of them was more than forty-five feet long by eight and a half feet wide, and it constituted the central portion of a "mound" ninety feet in diameter. As a rule, both large and small rooms occur in each building, but often a building is found to contain small rooms alone. In many instances the compartments are extremely small, such, of course, having been intended for the storage of corn, meat, water and implements, as is shown by the character of the remains frequently found within them. The opening of each compartment must unquestionably have been in the roof, for I have never found an opening in the walls, although I have many times found the entire walls of the houses in a perfect condition. Stone corn mills or *metates*, complete or broken, were found in or beside all of them. Bone skewers in considerable numbers and arrow points were also found in every house ruin. More or less broken earthenware of good quality and of various designs occurred scattered within the ruins and upon and around them. Most of this earthenware had been glazed and much of it painted, mostly in black figures on the inside of the vessel. One house yielded two small trinkets of green aluminum phosphate, either variscite or inferior turquoise. The same house also yielded a small pipe of pottery, consisting merely of a straight, conical bowl, and in general form closely resembled the catlinite stone pipes of the burial mounds of North Dakota, and the solitary catlinite pipe from the cave in San Juan County, Utah, to which reference has previously been made. There were present several specimens of what may have served as pipe stems, having been cut in suitable lengths from the hollow wing bones of birds. Remains of bones of mammals were numerous. These were invariably broken in a similar manner, and appeared to be the bones left from pieces of meat, the flesh of deer, rabbits, Rocky Mountain sheep, antelopes, etc., that may have been used or stored away by the owners. A large number of these broken bones gathered from many house ruins formed an interesting collection, especially when compared with those gathered in the ruins of other



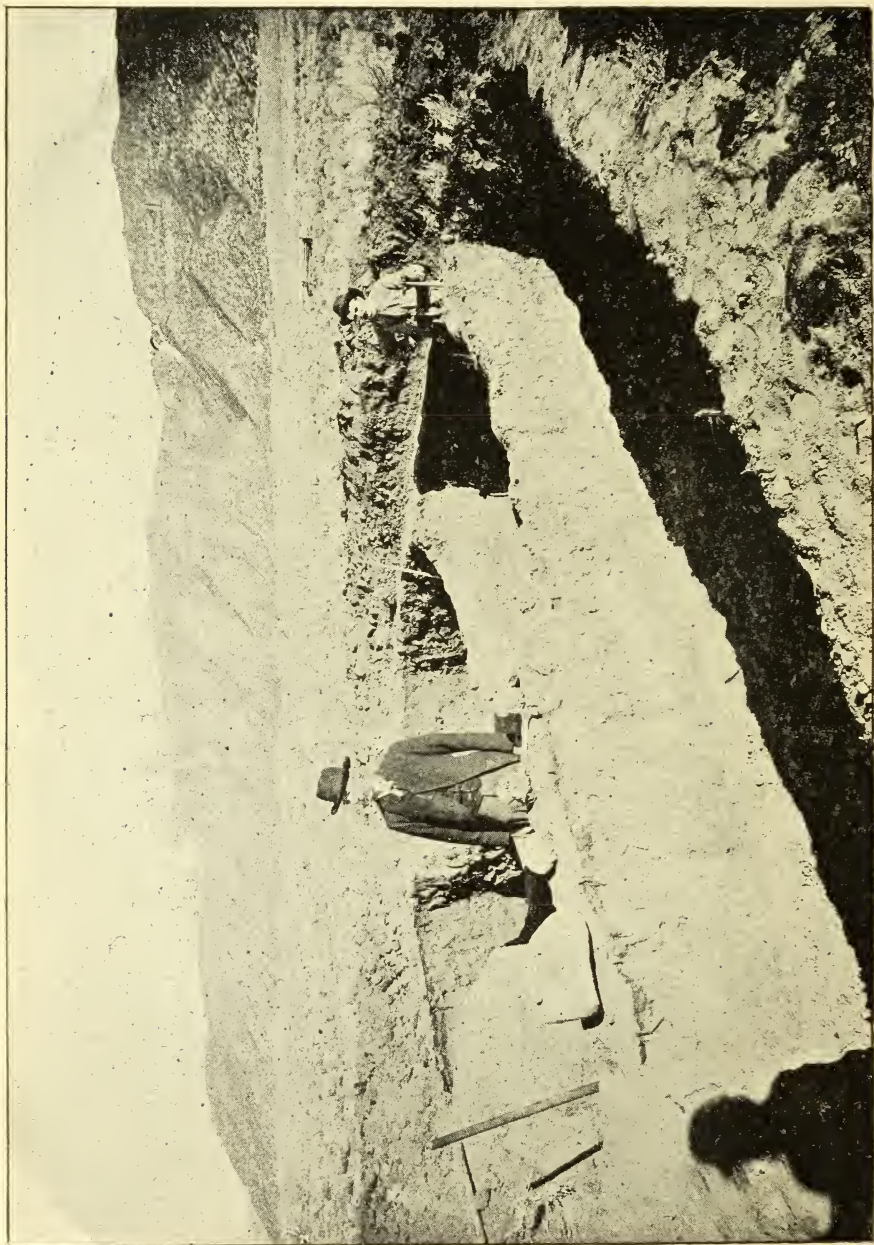
Plastered walls of one-roomed house in ruins, near Paragonah, Iron Co., Utah. Explored by H. MONTGOMERY, in Jan'y, 1893.



parts of Utah. Human skulls and skeletons were found in Mason City, but they were not in a satisfactory condition of preservation. There is one thing, however, which deserves special mention here, namely, the composition of the adobe or mud walls. I use the word "adobe" because the lumps of which the walls were composed, usually contained two other things in addition to the mud. Numerous small particles of charcoal and pottery were generally found scattered throughout the mud, and giving every indication of having been mixed with the mud by the builders of the houses. Sometimes these lumps or bricks were too irregular to be easily traced; at other times they were so regular in form and size that the separate lumps standing in straight rows could be clearly and readily distinguished. In nearly every instance, continuing the excavation through and beneath the floor, showed the house to be situated upon a heap of earth mixed with ashes, charcoal and little pieces of broken pottery. Again and again I have cleaned off and fully uncovered the one-story houses in an almost complete state of preservation. Thus far, everything is plain; but my explorations beneath these houses have not been so satisfactory. There occur many fragments of bones, pottery and charcoal below the floors, but all seem in a state of confusion. In two instances I found a strong, upright cedar post or pillar with lumps of hardened mud built to make something like a flue or chimney, and all of these were under the houses.

#### PARAGOONAH RUINS, IRON COUNTY.

From January 9th to 14th, 1893, I visited and explored ruins beside the little village of Paragoonah in Iron County, some 250 miles south of Salt Lake City. Here were about 100 mounds of ruined structures, the largest of which was about 160 feet from north to south, 200 feet from east to west, and twelve feet in height. The "mounds" and the surface of the ground around them, as in Juab valley, Salt Lake valley, Utah valley, the valleys of Piute County, Emery County, and elsewhere in Utah, had numberless pieces of broken pottery, stone arrow points and chips of obsidian, chalcedony, opal and quartzite scattered over them. The largest ruins gave evidence of having been slightly disturbed at two places upon some former occasion, perhaps by Major Powell of the U. S. Geological Survey, or by Dr. Palmer, both of whom visited southern Utah several years ago. However, by far the larger portion of this heap of ruins remained unexplored, and I chose a favorable-looking elevation, which formed part of the north side of it, as the basis of my operations. Preferring not to use the plough and scraper which were at the same time being freely used by the Territorial World's Fair representatives on the south side of this mound, I set to work, aided by five men employed for the purpose, to excavate and open up the remains of the ancient buildings. As is my custom, I carefully removed, inch by inch, with shovel, trowel and brush, the debris, and soon uncovered perfect, upright walls of an independent



Walls of house containing four rooms, near Paragonah, Utah. Explored by H. MONTGOMERY, in January, 1893.



house containing four compartments entirely devoid of windows and doors. The walls were of cement adobe, as in other valleys, and were on an average about fourteen inches in thickness and three and one-half feet in height. The whole structure was about sixteen by twenty feet, outside measurement. The two west rooms were each six and one-half feet square, while the east rooms were a little larger, being respectively seven and one-half feet and nine feet eight inches in length. The following articles were found in this building: One bone awl or skewer, one bone bead, one perfect stone *metate* of the usual shape, and similar to those found by me in the cave and cliff houses of eastern Utah, several pieces of charred corn cob, and many pieces of broken earthenware of good quality and of the well-known varied patterns. The floors of all the four rooms were at the same level, and consisted of three layers, as follows: Adobe in the bottom, next a complete and carefully laid layer of smooth, water-worn, rounded stones (principally limestone) from three to five inches in diameter, and the latter layer of water-worn stones was in its turn overlaid by a firm layer of the adobe, which constituted the upper surface of the tolerably smooth and level floor. At my request the World's Fair photographer took a view of these rooms as uncovered by me, and that view is herein reproduced. On cutting through the floor and continuing the excavation for a depth of seven feet below the floor above described, I found a confused heap of earth containing scattered fragments of pottery, charred corn cobs and bones, but no evidence whatever of walls, floors or other parts of a building. This condition is of precisely the same character as that found in several of the Juab Valley ruins. The structure consisted of but one story, which rested on the heap of earth, ashes, broken pottery and other refuse.

During the exploration of this four-roomed house my attention was called by the World's Fair representative, Mr. Don Maguire, to his discovery of several human skeletons within a few yards of where I was working. These remains were lying about three feet beneath the floor of a house. With them were found charred thread and corn, and not far from them, also, were broken pottery and other relics of the usual kind. All were about eight feet beneath the original surface of the "mound" or house ruins. The floor itself was quite complex, having, in addition to the three layers previously mentioned, a layer of sand, and, what was new to me, a continuous, horizontal layer of small pieces of pottery, thus forming a floor of five distinct and complete layers. The skull of one of the skeletons had a greatly flattened occiput, and in all respects resembled the flattened skull of the "cliff-dweller," whilst the remaining skulls had naturally formed occiputs. Here, therefore, occurred, together and beneath the floor of a valley house, both kinds of skulls, of which a description was given in my account of Mr. Lang's collection from the caves of San Juan County. If, as some persons have claimed, they are of two distinct races and lived at different periods of time, how has it come that they have been found at Paragoonah in an

equally good state of preservation, and buried together under the aforesaid conditions? To me it seems plain enough that they belong to the same race, and that the artificial flattening of the cranium was practised by only a portion of that race.

An account of my investigations in the pre-historic town near Marysville in Piute County, and elsewhere in the valleys of Utah, would be almost a repetition of that just given of the investigations in Juab and Iron. I have examined similar structures and remains in Beaver, Tooele, Salt Lake, Emery, Utah, Millard and other counties of this territory, and, when I think of the labor, care and intelligence that must have been bestowed upon the construction of their buildings, as well as the manufacture of their excellent pottery, their ornaments and implements, I am surprised that the remains of their works occurring in widely separated districts should differ so little. A remarkably close union must, without doubt, have existed amongst the ancient people whose monuments are the subject of this writing. Marine shell beads have been taken from the house ruins in the so-called "mounds" or tumuli of the Sevier valley, and likewise in Emery County. I have a lump of lead bullion said to have been found in a "mound" of Millard County. A good, well-burnt brick of unusual size and shape has been discovered in house ruins near Willard on the northeast shore of the Great Salt Lake; pre-historic irrigation ditches occur with the Beaver County and some other valley ruins. But, everywhere the same permanent buildings, the same walls, roofs and floors are observed, the same wonderful pottery, and the same stone and bone implements, utensils and ornaments are presented to the eye of the explorer.

*(To be continued.)*

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THE last mound located within the corporate limits of Columbus, Ohio, was opened in July and August. Originally there were six mounds and two village sites on the ground now covered by the city. In the mound were twenty-seven skeletons. Many beads, celts and flint implements lay alongside four of the remains. Three of the Crania were taken out whole. The work attracted general attention and from four to five hundred people visited the excavation each day.

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MR. GERARD FOWKE, one of the best authorities on American chipped stone implements, will present three papers to readers of the ARCHÆOLOGIST in the November, December and January numbers. He will treat of the manufacture of stone relics, the distribution of the material, etc. Collectors should inform their friends of these important contributions to Archæological literature. Extra copies may be had at the usual rates.

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## EDITORIAL.

ARCHÆOLOGICAL investigations have progressed to such a point in Europe that knowledge on the subject is far more systematised in that country than in this. Their various surveys have been so thorough as to include almost all known remains, and should the latter be obliterated they could be restored from the notes on hand. Foreign interest in all such work is at a much higher pitch than among us, and the work is more appreciated and better supported.

We have nothing to compare with the completeness of archæological investigation in the old country. In no instance has a large and complete survey been

made of any extensive region in America. A few small sections have been mapped, but with a single exception, no area the size of a State has been attempted.

In Ohio a plan of work has been adopted that will result in a complete map, giving the position of every aboriginal structure in the State. The original map will be drawn on a large scale, and so accurately constructed that every point of archæological interest in the State can be indicated within a distance of one hundred yards.

Already nearly eight hundred mounds and earthworks have been definitely located. The collectors and county surveyors throughout the State are in hearty co-operation with the work, and have furnished valuable data concerning the remains of various localities. In the coming winter many additions will be made to the work now in progress. Five years' time is necessary to complete the map. Collectors will gain an idea from the time estimate of the extent of the work. Every mound, fort, village site, quarry, hearth or grave-yard in the State will be accurately located. A general correspondence with the students of Archæology in the State will be necessary.

When completed it will be of incalculable value to science, and to Ohio will belong the honor of having been the first American State to carry out such an undertaking. It is well that this should be the case, for Ohio is especially rich in pre-historic remains, and there is not a county that will not be represented by many mounds or remains of some kind.

It is hoped that the other States of the Union will profit by the ex-

ample and follow in the footsteps of Ohio, and begin a careful and systematic recording of all the portion of the State that will be interesting from an archæological point of view.

Collectors knowing of mounds and other remains will confer a favor upon the Ohio Archæological and Historical Society by writing to the Editor of THE ARCHÆOLOGIST telling of the location of such monuments. County (with townships) maps will be sent to all collectors, and upon these the earthworks, tumuli, etc., can be recorded. All should co-operate in making the map a success.

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#### DR. HILBORNE T. CRESSON.

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It is our painful duty to record the death of Doctor Hilborne T. Cresson, of Philadelphia. He was one of the best informed Archæologists in the United States, being well versed in the German, French, Spanish and Italian languages, an artist of ability whose paintings have been hung in the Salon of Paris, a graduate of the Jefferson Medical College, and from one of the institutes of Paris (France). He was regarded as one of the best Craniologists in the country. Of late years he had devoted much of his time to a study of the Maya manuscripts.

His mind, perhaps affected by the hard study to which he gave his life, seems to have broken down, and on the night of Sep-

tember 7th he shot himself in one of the New York city parks. It was more than a day before the police established his identity and turned the remains over to his friends. His age was forty-eight years. A wife and two sons survive him.

Knowing him as we did—having been in the field with him for many months—recognizing his genius and ability, we feel his death profoundly. Perhaps his end was hastened by disappointments. He hoped to secure some position to which his talents entitled him, but he could not reach the desired goal. He felt keenly his failure to get into one of the new museums. He faithfully served for several years one of the Eastern Professors, a man high in Archæologic matters, and as a reward that man turned the cold shoulder upon him.

His attainments outweighed his faults. Those of us who knew him must bear testimony to his gentlemanly bearing, his scholarly attainments and his useful life. We must forget his peculiarities, for we possess them ourselves.

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#### CORRECTION.

The figure on page 232, August number, Professor Montgomery's article, should be called *atlatl*, or throwing stick, instead of medicine stick.



## BOOK REVIEWS.

"The Illustrated Archæologist," published quarterly at 4 Lincoln's Inn Fields, W. C., London. It is well illustrated, and contains 64 pages of text per quarter. The subscription price is \$2.50 per year. That is very high when one considers that the journal prints less than 300 pages in a year. The articles all refer to discoveries in Europe. The magazine is the most valuable one that has come under our notice, and is well worth a place in any student's library. The article in the June number, "The Meayll Stone Circle, Isle of Man," is one of the best illustrated (clearest) articles we have seen in the magazines of the past year.

"A Study of Certain Figures in a Maya Codex," by J. Walter Fewkes, reprinted from the American Anthropologist for July, '94. With all the attention now directed to the Maya writings we may soon expect translations. Mr. Fewkes has entered this field, and like Cushing, having the advantage of study of ancient symbols and characters in the southwest, he certainly is well prepared. His present paper seems to be the forerunner of a more complete treatise. He reviews the work done up to date on the hieroglyphs.

"Charm Stones," by Dr. Lorenzo G. Yates, Bulletin 2, Santa Barbara Society Natural History. He treats of the plummets or sinkers of California in a pamphlet of forty pages (four plates). The contribution is an addition to our literature, especially to that treating of stone ceremonials and ornaments. Some collectors will accept his conclusions, others throw them overboard as being too theoretical. The book is well worth having, but we doubt if many of his conclusions are well founded. As to the use of polished plummets, he says: "The Napa Indians also stated that they were sometimes laid upon ledges of rocks upon high peaks, with the belief that, owing to their peculiar form and some occult power which they possessed, they traveled in the night through the water to drive fish up the creek to favorite fishing places, or through the air to drive the land game up towards certain peaks and favorite hunting grounds. The peculiar pear-shaped form was given them to enable them to cleave through the air and water." He also states "that they were used in time of war, as they were sup-

posed to travel about at night for the purpose of worrying the enemies of their tribe."

"The Development of Sculpture," a preliminary paper, by J. D. McGuire. Reprinted from the American Anthropologist for October. It is rather general for the student of American Archæology. The subject, however, is one upon which all intelligent persons should be posted.

"A Journal of American Ethnology and Archæology," Vol. iv., '94. Edited by Dr. J. Walter Fewkes. (Reviewed next month.)

"Certain Shell Heaps of the St. John's River, Fla." By C. B. Moore. This good book will be reviewed next month.

"Memoirs of the International Congress of Anthropology." Edited by C. Staniland Wake, Chicago, 1893.

The papers presented in this attractive volume are of value and interest. Most of them are by Americans, and they speak well for our progress in anthropologic matters. But although much may be said as to their excellence, yet no well-posted Archæologist can avoid feeling disappointed in the work of the Congress. It was not international, it presented no greater number of carefully prepared papers than are annually read in Section H of the American Association. Only four papers were read by gentlemen from abroad. Many pamphlets and papers were sent by foreign scientists who could or would not be present themselves. Many of our American Anthropologists took little active part. Professor Putnam, the man who, above all others, should have prepared and read an exhaustive paper upon his work and the conclusions he has reached, made a few simple extemporaneous remarks. The nature of his discourse is barely alluded to in the report. Messrs. Holmes, Brinton, Mason, Fewkes, Cushing and others, *individually*, were the backbone of the Congress, and alone saved it from disgrace. The proper management of this Congress of Anthropology would have made it as interesting and influential as the Congress of Religions. The latter was known throughout the entire

world. Would that we could say as much in behalf of the former.

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Tenth Annual Report of the Bureau of Ethnology. Major J. W. Powell, Director, Washington, 1893.

The report for the year 1888-9 is just out. It is superbly illustrated after the customary manner. Col. Garrick Mallery contributes "Picture-writing of the American Indians." This fills the entire volume, and will be a lasting monument to the author. Col. Mallery has devoted years of study on the plains, in the mountains, and at Washington, to the pictographs of the American race. As an authority regarding their age, interpretation, etc., he stands first among ethnologists. The Winter Count of the Dakotas (Battiste Good, recorder) given at length, and covering more than 100 years, is of historic as well as scientific value. It

completely records the movements of Sioux-an families, their campaigns against the whites and other tribes, hunting expeditions, etc.

The volume stands higher than the previous publications of the Bureau, and Col. Mallery is to be congratulated. Students should apply for copies through district congressmen.

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"Pre-historic Civilization in the Philippines." By Elsdon Best.

A pamphlet describing the life of island tribes in the Philippines. It will interest Ethnologists, and is an important contribution to Anthropologic literature. The author appends a list of reference books to his narrative. His observations among these tribes will be published in the November number of THE ARCHÆOLOGIST.

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## COLLECTOR'S DEPARTMENT.

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### ARCHAIC REMAINS IN EGYPT.

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Egypt had its archaic as well as pre-historic period—its time of evolution from a mythic to a civilized era. This period preceding Mena, the first king, be it a thousand or two thousand years, was an archaic period—one of a crude civilization possessed by tribal communities evolving at last into a fully civilized and united kingdom, when the course of the Nile was turned and Memphis, its capital, was built.

Excavations during the past winter and spring, conducted by D. S. Petrie at Kofo (the ancient Keftu or Coptos), some thirty miles below Thebes, brought to light the remains of two or three primitive statues of the god Khem, which have already been pronounced by one or two scholars, perhaps prematurely, to be the oldest work of

art in Egypt—old, even in that venerable land, when the great pyramid was built. Khem appears to have been a local deity at Keftu; he was generally worshipped in Egypt as the god of life in nature and in later times was held in special reverence at Thebes and Panopolis. The feasts in his honor were called "the bringing forth of Khem," and his title *Ka Mutf*, "Bull of his Mother," and designation, "Father of his own Father," indicate his self-originating being. Half of a tablet found represents the wife and daughter of Rameses VI., whereon the former is styled "Gold and Lapis Lazuli," and another stela of the Eleventh Dynasty, represents a dog under the chair of the deceased man and his wife—an allusion, doubtless, to the sports of the chase so characteristic of that period.

But the statues now claim our attention.

They were taken from the clean sand on which were placed the foundations of the temple. The head is simply a rounded block with roughly cut ears and a beard, minus the face. The face was supplied by a wooden mask, probably of ebony wood, in order to be characteristic of the god. The legs consist of a pillar six feet long, with a groove between to mark their division. One or two fragments reveal half-developed arms and other crude and disproportioned attempts at art. Sculptures on one leg represent a symbol of Khem; also a cow, an elephant, and a hyena upon the mountains. The elephant points to an extremely early period in Egyptian history, and it occurs but two or three times on the monuments of later times. On another fragment is a girdle of thongs with a decorated flap, and on another portion of a statue are seen the ostrich, the sawfish and sea shells.

As Coptos was the Nile end of the trade route between the Red Sea and the Nile, the sawfish and shells on this statue of an archaic period go to show that the settlers in Egypt, at least in that section, came from the Red Sea. Dr. Petrie intimates that these primitive statues, some thirteen feet in height, are akin to the stone age in Europe. He also observes a gradation of art in the figures. More information concerning this archaic discovery will be awaited with deep interest.

In the debris of the mounds at Coptos were found flint flakes and knives. That city is first mentioned in connection with Mentu-hotep of the Sixth Dynasty on an inscription at Konosso, an island above the first cataract. Compared with the sculptures of that dynasty, these recently disinterred statues as works of art are crude in the extreme, and point to the beginning of statuary effects in pre-historic Egypt, or during the period tribes and clans occupied the Nile valley. I have always considered that the dynastic Egyptians entered Kamit (their most ancient name for Egypt) by the Koser-Coptos route, and to me not the least

valuable of these discoveries is their proof to aid this theory.

REV. WILLIAM C. WINSLOW, SC. D.

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### GUN FLINTS.

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From the earliest times flint has been employed as a fire producer in classical authors, allusions are made to flint knives, and the employment of flint and steel to produce fire is very pointedly described by Virgil. About the middle of the seventeenth century, a gun lock was invented in Germany by means of which the spark from a flint was utilized in firing. The form and action of this gun-lock continued in use almost without modification down to the year 1834, when it was superseded by the discovery of fulminating powder and the introduction of the percussion cap. Flint in composition consists of almost pure silica partly in the crystalline or non-soluble quartz form, and partly in the non-crystalline soluble state. It contains lime, iron and aluminum, and when the proportions of lime present are large, it passes into chert. When newly obtained from the pits, the contained moisture of flint renders it easily flaked, but after exposure to the air, it becomes hard and intractable. Its origin is not yet satisfactorily explained, but as traces of marine organisms which flourished in the cretaceous epoch are almost invariably found in the nodules, it may be assumed that the siliceous matter was partly derived from those organisms forming a nucleus around which soluble silica accumulated. The material from which the great bulk of the gun flints were made is found in the upper chalk beds and other limestone deposits in the county of Norfolk, England. It occurs in horizontal layers of small flints and irregular nodules of pear-shaped outlines, varying in size from a few inches to three feet in length by one foot in thickness. These are imbedded in the chalk at right angles with the horizontal layers of small flints. A noticeable

feature is that the various beds of flint are possessed of a uniformly distinctive character as regards color and composition. The mining was carried on by sinking a narrow perpendicular pit of about four feet in depth, then a like distance in a horizontal direction, continuing in a stair-like series of burrows until a suitable stratum of flint was reached. By this plan of short galleries, they were enabled to pass all excavated material to the surface by hand.

Three operations were required in the manufacture; first the nodules were broken into convenient sized cubes of about six inches. The second operation called "flaking" consisted in striking, by carefully directed blows, flakes of a uniform thickness from the cube, extending from end to end until the piece became too small to yield good flakes. The third operation termed "knapping," consisted in cutting or breaking the flakes transversely into the required sizes for gun flints. An expert flaker could produce from 7,000 to 8,000 flakes per day of twelve hours, and in the same time an average "knapper" could finish about 3,000 gun flints. The manufacture of gun flints was also carried on in Germany and in France, but the difficulty of producing suitable material in sufficient quantity and of the desired quality in these countries, gave England, with her unlimited supply of the raw material of such excellent quality, a practical monopoly of the industry. The manufacture of gun flints was still carried on in the villages of Suffolk, Brandon and Icklingham England, as late as the year 1876, in which year 80,000 gun flints were sent away weekly, the greater portion of which were sent to the west coast of Africa.

The tools employed in the manufacture of gun flints consisted of three simple forms of hammer and chisel. It is probable that the only essential modification these tools have ever undergone consists in the substitution of metal for stone. The "flaker" is a cube of steel with pointed ends fitted with a round handle; the "knapper" is a disc of steel three-fourths of an inch thick, also

having a round handle. The chisel of steel is two-edged; it is placed upright in a block of wood. Its upper edge upon which the flakes are cut by the "knapper's" disc hammer can be reversed when dulled by use.

THOS. HARPER.

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### PALEOLITHIC MAN.

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J. D. McGuire, Esq., of Ellicott City, Maryland, publishes a paper in the July number of *THE ARCHÆOLOGIST*, and in his opening paragraph says that certain criticisms in *Science* and the *American Naturalist* have "re-opened a discussion of the whole subject of a Paleolithic period and its relation to the Neolithic period" in America. Suppose, therefore, the whole ground will have to be gone over, with a re-statement of the old positions, and a presentation of any new ones. We will be thankful if out of this there comes some progress towards a settlement of these questions.

But it is not for this purpose that I now write.

Mr. McGuire quotes from one of my papers, although he does not mention my name—speaking of the relation of the Paleolithic and Neolithic periods as they are divided in Europe, in which I deprecated a "discussion in this country of matters which belong to other countries, and which having been fully investigated for years by the scientists of those countries, have been accepted as settled," and which I think "neither require demonstration nor admit of discussion." Mr. McGuire criticises this in a good natured way and says (p. 206), "an opinion differing in any way from any European dicta is resented by some (me?) as heresy." The present letter is anent this difference. Mr. McGuire states "there is, in many instances, a radical difference among the best known European Anthropologists as to the relative status of the Paleolithic and of the Neolithic Man," and he proceeds for two pages to present these in detail, as, for example:



"One says Paleolithic Man used only roughly chipped stone implements, \* \* another, that he chipped stone with a delicacy never excelled. \* \* One says that he made pottery, another says he did not, while a third says something else. \* \* Another says that Paleolithic Man had an artistic sentiment, and during the Neolithic period he had none." Mr. McGuire says, "these varying views and differences of opinion \* \* admit of discussion."

If he intended to make his argument applicable to my position, he might have saved himself, for my paper admits all these (and more) differences of detail between European scientists. I say on the adjoining page to his article in the same magazine: "Whatever differences there may have been between the scientists (of Europe) as to the antiquity of man, or the locality of his original appearance; the manner of his civilization; his use of the implements (*and these differences have been almost infinite*);" \* \* indeed, the differences have been greater than given by Mr. McGuire, and I intended, by the foregoing sentence, to give them as broad a sweep as possible; yet my main proposition, the one which this led up to, is the closing part of the sentence, that whatever these differences may have been, "nearly all European scientists have agreed upon the existence of this Paleolithic period, and that it was anterior to the Neolithic period." I meant to be understood that upon this proposition nearly all European scientists are agreed, and they have accepted it as settled with a unanimity which neither requires demonstration nor admits of discussion, and I adhere to that opinion.

THOMAS WILSON.

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Editor of THE ARCHÆOLOGIST:

DEAR SIR—I have been reading from the first number of THE ARCHÆOLOGIST of the many interesting finds made in different parts of the United States. I should like to say a few words about the relics of this part

of Indiana. Our region is not so rich as other sections of the country, and the collector must be content with surface finds. There are but few mounds and earthworks in central Indiana. Relics are sufficiently numerous to make the region interesting to a student of Archæology.

One of the most discouraging things to a collector is the universal habit of farmers throughout this region, of chipping or knocking fire out of flint. Thus many of the finest arrow and spear heads are broken or damaged through ignorance and indifference. It is hard to get farmers to preserve intact the finds they make.

I have a very fine jet black slate platform pipe. It is highly polished, and is one of the finest relics I ever saw. It is nine inches long and two and a half inches high. This relic was washed out of the bank of a stream in company with two other pipes and a skeleton. I have a green banded slate ornament unlike anything I have seen. It is circular in form and has two deep notches cut in the edges at the center. It resembles a flint hoe, only the notches are deeper cut. The maker started to drill a hole through from one notch to the other, but only partly completed his work. The specimen is finely finished. I have a long tube pipe eight inches in length and wide at each end, but narrow in the middle. It is of good workmanship, and one of the rarest relics in the hands of collectors.

I have two other interesting pipes, one of which has a small hole through the stone below the base of the bowl for attachment by a cord to the stem. If the pipe became loose, the cord prevented its being lost. I will describe other relics of mine at some future date.

C. E. TRIBBETT.

September 1, 1894.

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Washington, August 12, 1894.

Editor of THE ARCHÆOLOGIST:

DEAR SIR—I have been making some investigations into the processes of the abor-

iginal American mechanics. These include his *materials, tools and apparatus, processes, products* and their *functions*. The study embraces *tools, mechanical powers, standard measures, engineering*, together with the special outfits for each craft. In studying the stone worker I came naturally upon the so-called *chungkee stone*. There are countless numbers of these easily within the capabilities of the American mechanic as I have studied him. But there is one type, in cross section resembling a double blade of a battle axe. It is a napiform disk, hollowed on both sides to a cup shape, with a slight pit with a raised border in the centre.\* These objects are perfectly centred; the borders are true circles, and the edges of the cup-shaped cavities are sharp and true. In a lathe it is possible to produce one of these objects in half a day, but there is no device of savagery capable of effecting such scrupulously exact lines. This leads me to ask my brother ethnologists whether any of these peculiar shapes were found under circumstances to preclude the possibility of their having been made by white man's machinery long ago and bartered to the Indians.

OTIS T. MASON.

## INFORMATION FOR COLLECTORS.

BY THE EDITOR.

A good pestle is rarer than a grooved axe, and more valuable.

No find should be kept together more sacredly than a cache of leaf-shaped implements, yet several of these have been scattered by collectors during the past year.

Every collector seems to be overstocked with ordinary knives, arrow-heads and broken flints. There is no demand for such relics. Recently, a gentleman wrote

to seven well-known dealers and offered 3,000 average flint implements at one cent each. None of them would accept the offer. Five or six years ago the same number of specimens would have brought three cents each.

The percentage of specimens in the average collection is: Broken pottery, 21%; flint implements, 60%; axes, 4%; ungrooved axes (celts), 5%; whole pottery, spades, hoes, 2%; pestles and hammers, etc., 4%; hematites and ceremonials, 1%; pipes, ornaments, odd species, 3%.

The greatest mound region is the South. The monuments of Alabama, Mississippi, Louisiana and the Carolinas have never been thoroughly explored or described. It is the great field for future archæologic work. There are many groups of *tumuli* which exceed in magnitude anything found in the North. The expense necessary to the conducting of thorough work has kept vandals from carrying on the destruction of the larger mounds.

Speaking of vandals, no State has suffered more at the hands of reckless, careless mound diggers than Arkansas, and especially the "pottery belt" of that State. The fine clay vessels found in considerable numbers are highly prized by wealthy collectors, and have a high commercial value. Four or five adventurers, trappers and men who have a superficial education and no regard for science, have carried on explorations for the past ten years. A number of large collections have been made, and perhaps twelve or fifteen thousand pieces of pottery are now in museums, in the hands of collectors and otherwise scattered throughout the country as a result of their labors. No notes, drawings or photographs accompany the specimens. No reports have been published. One simply sees the long rows of "pots" on the shelves and a general label, "From Mounds in Arkansas," accompanying the exhibit. Future gener-

\* These are commonly known as discoidals, and are regarded as pre-historic. They are found in the oldest mounds, under conditions making them unmistakably ancient.—Editor.

ations will have only these vessels to study, and our knowledge of pre-historic life in Arkansas will be more scanty than that of any other region of the country.

Among the commonest of the larger specimens of aboriginal manufacture—so abundant, in fact, that very few collectors attempt to increase the number in their cabinets—are cup stones and stone hammers. The former have been found in great abundance in nearly every portion of the world where primitive tribes or races have long existed, and yet there is very slight mention of them among the numerous volumes or letters of any class of travelers. It would certainly appear that some specimens of such widely spread utensils (or whatever they may be called) would have been seen in use among the lower races who have been so closely studied by scientific men, and yet there is but one record of such observation. In one of the Smithsonian reports a writer speaks of their use among the Patagonians to furnish a support for the lower end of a spindle, the hole having a piece of hide fitted closely into it, forming a little cup, which is then filled with tallow in order that the spindle-stick may revolve easily and steadily.

All sorts of uses have been invented by various writers to account for them, but none that will account for the varieties in form existing among these relics. We are told that they are to serve for supports for spindle-sticks, or for fire-sticks, alluding to the primitive method of producing fire by twirling between the hands or with a bow string a stick whose lower point rests on a piece of wood; but it is unlikely that sufficient heat could be produced in this way to ignite the powder that would collect in the bottom of the hole. Even admitting their use for both of these purposes, it is evident that such explanation would apply only to those with a single cavity on one side, as it would not be possible to utilize more than one stick at a time, and the stone would need to be quite large in order

to remain stationary. It is also stated that they are for paint cups, but again only one hole could be used at a time, and in this use the stone would have to be small for convenience in handling.

Another attributed use is for a support to the drills used in perforating stones or shells for pipes, ornaments, etc. This seems rather to reverse the usual order of work, for it is customary, because most convenient, to have the drill-point downward, as otherwise the operator could not at all times see what he is about.

The most prevalent belief is that they were used as nut-crackers; that is, the nuts were placed in the cavities and a number were broken by a single blow of a large stone. A supposed proof of this is found in the stones occurring where there are many hickory and walnut trees; but such trees grow in many places where no cup-stones exist, and many of the latter have been found in places where nut trees have never been known to grow; and, at any rate there is nothing remarkable about such a coincidence, for this timber flourishes best in a rich soil, and Indians sought such ground on account of its easy cultivation. The objections to the theory are two: very few of the stones have holes in the same plane, so that not all the nuts could be struck at once, and it is not the proper way to break them because they would crush into angular fragments, from which the kernel could be extracted with difficulty.

So, despite the great abundance of these stones, their occurrence on high hills and in narrow valleys, on fertile ground and barren, in mounds, about village sites, or far from any permanent indications of settlements, we are as yet entirely in the dark concerning their use or uses, and this, too, notwithstanding the publication of numerous papers about them, including at least one pretentious monograph.

The cup-stones in their simplest form do not differ from the pitted stones—water-worn, ellipsoidal pebbles, with a cavity pecked in each flat face to afford a purchase

for the thumb and finger while the periphery of the stone is used for cracking nuts, breaking bones and various other purposes required by savage conditions. Every possible gradation is found, from the stone of fifty pounds, or even more in weight, with mortar cavities, and thirty or forty holes on each face, to the ordinary pebble, whose only artificial marking is the slight roughening on two opposite sides.

The flattened pebbles seem to require this pitting, as otherwise a tight grip would be necessary to hold them, which would soon tire the hand. The rounded or angular pieces of stone, however, could be held in such a way as to rest against the palm without causing sufficient jarring to be unpleasant. But while cup-stones and pitted stones are almost invariably of sandstone and quartzite, the hammer-stones are very seldom of any but the hardest and toughest material accessible, indicating more severe usage for them. They served to break up flint for arrow making, for pecking out axes, celts, pestles and other implements of hard, tough stone, and while the softer tools remain tools to the end, these harder ones are gradually worked into spheres, more or less perfect, for use as "slung-shots," club-heads and the like.

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### RECENT DISCOVERIES.

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Norse relics have been recently found in the neighborhood of Watertown, Mas. Cook's Pond near this town was recently drained, and on exposure the bottom showed the remnants of a roadway. The bed of the pond was dark, slimy mud, but through the center of it ran a well-defined path of white, clean gravel. The presence of numerous boulders in the roadbed, together with the smoothness of the stones, indicate that it has been washed, perhaps, to the depth of one foot. The pond is an artificial one constructed as a mill-pond about 100 years ago.

Word is received that Mr. S. S. Willoughby and Mr. M. J. L. Swanton have

made extensive finds on the east bank of the Union River, below Ellsworth, Me. Scores of arrow-heads, chisels, gouges and other implements were found. The collection will be placed in the Peabody Museum. It is probable, however, that the accounts of the find have been exaggerated.

The report that a mummy of an Indian nine feet one inch long has been found near Memphis, has probably no truth in it. Even the meagre accounts that have so far reached us do not agree. There are very few mummies found in this country, and those that are come from the cave dwellings in the southwest or the caverns of Kentucky. It is a pity that when such finds are reported that are as manifestly untrue as this one is, those who are responsible for the dissemination of such reports cannot confine themselves to facts or keep silent.

A long and narrow cave extending into the earth for a distance of two miles was accidentally discovered near the town of Mackinaw, Ill. The discoverers found at the end of the passage a small series of rooms and human bones, as well as weapons of war, indicated that it had been occupied by man. The mouth of the cave was entirely covered, and exposed to view through the agency of a land-slide.

A short time ago Edward Carey unearthed at Bluff Pond, Wayne County, N. Y., a rich mine of relics. Human bones, together with axes, knives, arrow-heads and pipes of stone were found enclosed in a stone vault. Square coins with an Indian head on one side and a bow and arrow on the other, indicates Jesuit origin, and were probably deposited by the Seneca and Cayuga Indians two or three hundred years ago.

Professor Cyrus Thomas, of the U. S. Bureau of Ethnology, believes that the Mexican civilization originated with the Malays of the South Pacific seas, and establishes a connection between the Malays and the Mayas, now in Yucatan. If true, this



will throw new light on the aboriginal races, and will result in an entire remodeling of the views hitherto held as to the origin of the native civilization of Central America. The newspapers are giving considerable prominence to the discovery.

Four skeletons lying side by side were found fifteen feet below the surface when excavating the Edgewood Avenue sewer, New Haven. They were in a bed of gravel, and in good condition.

A party of German explorers in the region about the Amazon River have discovered many tribes hitherto unknown to whites. They were especially proficient in the use of sign language, and many interesting facts concerning their manners and customs were learned.

A fine owl effigy pipe weighing five pounds was presented to the Department of Archæology of the Ohio State University. It was found near Columbus.

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### EUROPEAN FINDS.

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Near Schaffhausen, in Switzerland, a prehistoric settlement has been used successively in palæolithic, neolithic, and metallic times. Each period is distinctly separated from the others by differently colored strata. In the neolithic stratum were found more than twenty human interments, of both adults and children. Eleven of the latter varied in age from the new-born child up to that of 7 years, and some of them were buried with particular care. The adult interments consisted of the skeletal remains of full-grown European types, and small-sized people, who must be considered as pygmies of the neolithic period of Europe. These two races were found interred side by side under precisely similar conditions, from which it may be concluded that they lived peacefully together, notwithstanding their great racial difference. The remains of four of these pygmies, and probably of a fifth, were

found. There were seven interments of the taller race. Prof. Virchow says that the bones of the small race are not those of a pathologically degenerated people, but are of normal structure. In connection with this find it is important to note that Sergi and Mantia have discovered some living pygmies in Sicily and Sardinia. In appearance they look like miniature Europeans. In the opinion of Prof. Kohlmann these small types must be regarded, not as diminutive examples of normal races, but as a distinct species of mankind which occurs in several types dispersed over the globe; and he is led to believe that they have been the precursors of the larger types of man.

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### Site of an Ancient City Discovered in Mexico.

NEW YORK, Aug. 24.—A *Recorder* special from Oaxaca, Mexico, says :

Frank B. Lonark, an English archæologist, who came to this country two years ago to make a scientific research of the buried cities and other ruins in Chiapas, arrived here yesterday. He brings information of the discovery of a hidden city in the wilds of one of the southern districts of that remote State, which borders on the Pacific Ocean opposite the peninsula of Yucatan.

Mr. Lonark spent several weeks exploring the new found city. He claims to have made discoveries among the ancient ruins that will throw much light upon the early history of this country, and will create a sensation in archæological circles when made public.

He is now preparing a formal announcement of his adventures, which he will give out when he reaches New York a few weeks hence. He says the city he discovered had a population of fully 500,000 souls at the time of the wholesale decimation of its inhabitants; that the streets were broad and the buildings as large and of as handsome architecture as are now to be found in Mexico.

The exuberant newspaper scientist who periodically makes a marvelous underground discovery is again to the front. This time he has broken loose in Texas and in Nebraska. In the former State he has been finding a pre-historic man who neglected to trim his toe-nails, and left the imprint of them deep in the mud over which he pursued gigantic extinct animals. Of course there would be no fun in chasing beasts that would continue to live indefinitely; it is the peculiar province of primitive man to hunt curious looking animals that die off soon after he has done with them. We know all about his manœuvres this time, because the mud has solidified to a rock of tremendous hardness in which are preserved all the tracks of the hunter and the hunted, including the toe-nails. These footprints on the rocks of time are becoming somewhat monotonous, especially when we are gravely informed that they occur on some variety of stone that was formed under fathoms of ocean water untold ages prior to the appearance of anything that had the slightest resemblance to the *homo*. But, of course, there will always be people to believe in the possibility of anything that is manifestly impossible; the worst of it is that they are always wanting to argue the question. To be sure, footprints of different animals are abundant in rocks formed in shallow water, but it is only in those rocks that are formed so near the shore that they are uncovered at low tide. Human tracks could be made in such rocks, but only in such as have been deposited within the human era; and all such things that are reported as existing in stone that had its origin back of the present geological epoch, have been made there with tools.

The Nebraska man has found a cave. It is ten miles from Chadron, and the discoverer, so far as we have been able to ascertain his name, is Professor W. D. N. Freizenholtz. He is probably a good investigator; at any rate, he has found in this cave remains of all the animals that have

been identified and named from the time of Adam down to our own Cope and Marsh, along with a number of others that have escaped the nomenclature of all the zoologists. One of them was "like an elephant," with ribs twenty-five feet long. It is not stated whether this measurement was around the curve of the rib or straight across from tip to tip—most likely it was the latter. The Professor has failed to tell us whether there were any inscriptions carved on the leg bones; but he will readily find them with this hint. Some of the animals were "petrified." We do not wonder at this if they were suddenly introduced into such company; it would petrify almost anybody.

Seriously, the people who write these things do it only as a joke; but, remarkable as it may seem, there are hundreds, or even thousands, who accept the whole story as Gospel truth, and they are continually asking students as to the truth of the statements. It is partly in self defense that we have alluded to the matter as we have.

### ✓ HAMMER-STONES.

Hammer-stones, so-called, were used by the Onondagos 150 years ago, and probably within 100 years. They are frequent on early Iroquois sites, and even after they ceased to make flint arrows. Some have the usual battered edge, which may have been intended to give them merely a circular form. Others are angular, and sometimes have several pits. A circular one of my own is of a soft sandstone pebble, having pits on both sides, but without hammered edges, and is too soft for a hammer. It could only have been an anvil or a stone used in a game. The Iroquois so constantly used wooden mortar pestles that they would not have employed these in pounding grain, and the anvil use seems the most probable of all. I have seen one, however, marked in circles with compasses.

W. M. BEAUCHAMP.

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No. 11

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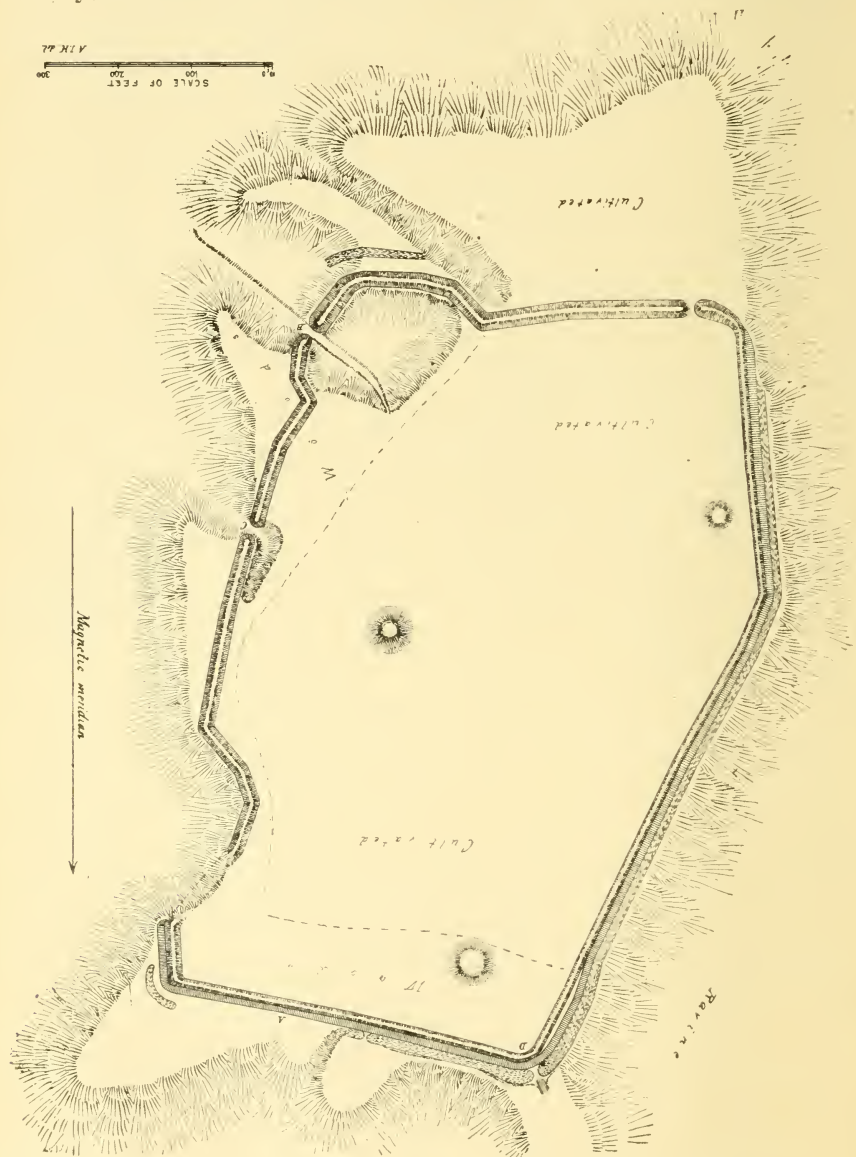
## THE "OLD FORT" OF CROSS COUNTY, ARKANSAS.

T. H. LEWIS.

CROWLEY'S Ridge is an elevated strip of land extending in a southerly direction through the northeastern part of the State of Arkansas, from a point on the west side of the St. Francis River at the Missouri State line, and terminating abruptly near Helena on the Mississippi River. Bloomfield and Commerce Bluffs in Missouri are probably continuations of the Ridge extending in a northeastern direction toward Cape Girardeau on the Mississippi. In Arkansas the Ridge is broken at a point some eighteen miles north of Helena, where the L'Anguille River crosses it. There is another break at the Missouri State line where the St. Francis river has cut through, and also at two other points in Missouri, where Castor and Little Rivers cross it. The Ridge proper is a back-bone, broad in some places and very narrow in others, from which many lateral winding ridges or spurs and deep ravines break off and extend in almost every direction. Some of the ravines broaden out into beautiful valleys, and some of the ridges terminate in fine plateau slightly elevated above the adjacent bottom lands, while others end very abruptly.

In these beautiful valleys and on these plateau are to be found many remains, in addition to the mounds, that are attributable to the Mound Builders, and even the ridges are not wanting in this regard; for mounds are to be found at many points, and nearly every ridge shows evidence of former occupancy in the way of village debris of various kinds. The only exception to the rule is at those points where gravel or broken chert protrude and form the surface of the ridge. But the most notable points of prehistoric occupancy are to be found on the plateau and sloping lands along the eastern and western sides of the Ridge, and in the broader creek valleys. This is especially true as regards those localities where creeks flow out from among the ridges and enter the rich alluvial bottoms. At such places, as a general rule, mounds are to be found, and nearly every available spot suitable as a dwelling place is more or less covered with village debris. In some instances these remains extend for miles, not only along the plateau, but also up the valleys.

On the northeast quarter of the northwest quarter of section 8, township 9 north, of range 4 east, in the northern part of Cross County, about nine miles in an air line east of south from Harris-



burg, and two miles south of west from Bay village, there is a fortified town site occupying the major portion of a plateau, the southern part of which is some thirty-five feet above the general



level of the adjacent bottom land lying to the south and southeast. The northern part rises from fifteen to twenty feet higher, having a general trend or slope to the southward. The position, both as a place of residence and for defense, was well selected, and in the latter regard is somewhat above the average; for there are no commanding positions in the immediate vicinity. This plateau is on the east side of Crowley's Ridge, between the two "forks of Sugar Creek," a tributary to the bayou of St. Francis River, and practically speaking is at the head of the main valley, which extends to the southward for nearly one mile, and then turns, almost abruptly, to the eastward. The valley here is about one-half of a mile in width, shut in by ridges that gradually increase their elevation as they recede from it.

The defensive portions of the works consist of embankment, artificial slope or "escarp," and ditches. The embankment along the west side follows the edge of the plateau, and is twelve feet in width and from one to two feet in height. At the southwest corner it leaves the edge of the plateau and crosses it in an easterly course, leaving a strip of land on the south side that is without defense. The embankment along this side is from twenty-two to twenty-four feet in width, and from two to two and one-half feet in height. On the east side the embankment is from eighteen to thirty feet in width, and from one to seven feet in height. The increased breadth and height in places is caused by carrying the embankment down gradual slopes to points near the bottom of two natural ravines. On this side near the northeast corner the embankment has been destroyed for a distance of about one hundred feet. Sugar Creek, which now flows some distance away, and cannot be seen on account of timber, etc., on the bottom that intervenes, has evidently washed the base of the plateau at some time in the dim past, causing it to cave off and carry with it that portion of the embankment. The embankment on the north side is twelve feet in width and from one to two feet in height, and for the greater part of the distance follows the edge of the higher land, where it breaks off in a gentle slope before reaching the steeper slope of the side of the ravine. The entire embankment of the fort was probably palisaded at the time necessity caused its construction, though there is no evidence at the present time to indicate that such was the case. This being the only part of the work that forms a complete enclosure—excepting the opening left as gates—in the absence of palisades, the major portion of the embankment would be utterly useless as a means of defense.

The escarp extends along the northern and western sides, and for a short distance along the east, near the northeast corner. On the north side (at A on the map) it is only four feet in height, but at all other points it is from six to seven feet in height, and has a regular and well-defined slope.

The ditch extends nearly the whole length of the western side, and along that portion of the northern side where there is a connection with a long ridge or hog-back, of which the plateau is the southern terminus. It also cuts off a small spur directly to the east

of the ridge, which is only slightly lower than the adjacent ground within the enclosure. Near the southeast corner there is a long spur projecting out from the plateau which is cut off by a ditch extending across the top and down the northeast slope. There is also another short ditch extending around the northeast corner of the enclosure, but this one is of doubtful utility. These ditches vary in width from ten to nineteen feet, and from one to two and one-half feet in depth.

There is an old passage-way down through a deep natural ravine (at B), which apparently served as the main exit to reach the bottom lands along the creek. On the south side of this ravine the embankment was started at the bottom and built upward in an almost perpendicular line, and an end view of it gives one the impression of an earthen column rising to the height of eighteen feet. At the point where the edge of the gradual slope of the plateau is met with the embankment, is seven feet in height. On the north side the embankment at the edge of the gradual slope is four feet in height, and only extends out far enough to continue the naturally steep face of the bank to the top of the embankment. The passage at the bottom between the natural wall and the end of the embankment is nine feet in width, and near the top between the end of the embankments, some fifteen feet. The surface of the passage-way has been washed out to the depth of one foot, but farther down towards the mouth of the ravine it has been cut out to the depth of three or four feet in places.

A short distance to the northward (at C) there is another gateway built on exactly the same plan, but the descent to it is much more steep and the bottom is washed out to a greater depth. A part of the end of the embankment on the south side is gone. The depth from the top of the embankment is now about twenty feet, but formerly it was not over sixteen feet. There is a third opening or gateway on the south side near the southwest corner which is five feet in width.

At the northwest corner of the enclosure (at D) there is a causeway over the ditch, and while there is hardly any evidence that it was used as an exit, yet it was probably left for that purpose; for it gave access to the high ridges to the northward. Within recent years this causeway has been used as a wagon road to get to and from the field, but previously the slope of the terrace was the same as at other points, the top being full and well defined. On the opposite (north) side it is evident that the surface of the ridge for a short distance had been graded down by the builders or occupants of the fort in order to give an easier approach to the causeway. This fact alone would indicate that it was intended for use. A short distance to the east there is another similar one, but in this case there is no graded approach, the nature of the ground not requiring it.

Within the enclosure when first broken up by the plough were the remains of about 150 huts. These locations were indicated by slight circular depressions, with a hearth consisting of burned clay, located near the centre of each. There were also about 180 other

locations where the burned natural surface and debris indicated the former existence of huts, but there were no depressions discernible. As there is quite a strip of uncultivated land in the northern part of the enclosure where the huts were the most numerous, it is presumable that there are at least 100 or 150 other hut locations that cannot now be traced on account of the leaf-mould, etc., that has accumulated over the whole surface since the place was abandoned. In addition to the hut sites noted above there were some fifty or sixty located on the outside of the south wall—between it and the edge of the plateau—which could only be traced by the burned surface of the soil and the debris. There were also a number of similar sites located on the higher portions of the adjacent bottom land. There is another plateau directly to the west of the one on which the enclosure is located, one prong of Sugar Creek—on the sides of which there is a narrow strip of bottom land—filling the intervening space. On this plateau there were formerly some 300 hut sites that could be traced, and probably half as many more that had been destroyed by cultivation.

In the northwest corner of the enclosure there is a flat-topped mound which is four feet in height. About one foot beneath the surface of the top there is a bed of burned clay, which is broken up into small pieces of various sizes and shapes. On the west side, toward the southwest corner, there is another flat-topped mound that is two and one-half feet in height, which is constructed on the same plan. It is impossible to determine whether these were originally built as burial mounds or not, but the probabilities are that they were, for similarly constructed mounds in this region have proved to be such. It is an open question, however, why the burned clay was placed near the top of mounds of this class. In some instances it is in fragments, and gives the impression that it is the remains of a clay hut or house which had become disintegrated and fallen in, but if so, why is there no floor or indications of one? And why was the debris covered with from one to three feet of soil? If the latter fact be accounted for by a natural and gradual accumulation of material, this class of works would be very ancient, but it is probable that they were constructed with some particular design in view. There are other instances where a convex bed of burned clay having an even top surface is found near the top of the mound, which, in the latter case, would bar the theory that they are the remains of slightly elevated houses. But there is yet another class in which the bed of burned clay has a concave top; these are the so-called "altar" or "sacrificial" mounds.

In the eastern part of the enclosure there is a truncated mound which is nine feet in height, that is undoubtedly a burial mound. The only other mound in the neighborhood is located on the bottom land nearly one mile distant to the southward.

This place must have been a very important stronghold in pre-historic times; for while there are other town sites located in this and adjoining valleys, and several very extensive ones a few miles distant along the "Bay Road" which skirts the Ridge to the east, yet

only one other site is fortified. The latter place—which has been under cultivation for many years—is on Mr. Peter Goodwin's farm, on the northwest quarter of section 33, township 10 north, of range 4 east, in Poinsett County. While this enclosure is not so extensive in area as the one in Cross County already described in detail, it was provided with two reservoirs, and the general appearance of the immediate neighborhood would indicate that there was a much more dense population located at this point.

My first visit to this region for archæological purposes was in April, 1882, at which time, and also in two subsequent years (1884 and 1888), circumstances were such that it was impossible to make a complete survey of the works and their surroundings, but numerous notes were made of such points as were liable to be defaced, such as the dimensions and heights of the mounds, and the width and height of the embankment on the south side, for the southern part of the enclosure was then (1882) being prepared for the second crop. A complete survey was made, however, on December 6, 1892, and a comparison of the results of twelve years of cultivation will be of interest, as tending to show what changes have been made during the interval. The mound in the southwestern part of the enclosure is now somewhat less than two feet in height, and the top is so defaced that it has the appearance of having been an ordinary round mound. The embankment on the south side—the only part that has been cultivated—has been reduced in height about eight inches, and flattened out in such a way that the exact line of the base cannot now be traced. In this connection it must be remembered that land in the "Cotton Belt" is not cultivated to the depth that it is farther north, consequently it would require many years of such shallow cultivation to totally obliterate these works.

For comparison with other similar ancient enclosures, the exact dimensions of this one, deduced from the field notes and map, are here furnished. The longest straight line that can be drawn across the works from outside to outside (*i. e.*, from the southwest corner to the northeast corner, including the detached ditch) is 1,230 feet, or a little less than one quarter of a mile. The greatest perimeter or circuit, being the length of a line drawn on the natural surface close to the outside limit of all the ditches, escarps and embankments, measures about 3,600 feet, or a little over two-thirds of a mile. The enclosed area, as bounded by the interior lines of the embankment, is 13.10 acres.

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By way of conclusion, a few words concerning the history of this old fortified village site may be in order. It has no history—at least none that has been recorded, for it does not seem to have been mentioned in any old book of travels or other printed work. Some of the citizens of Arkansas who are familiar with the narratives of the De Soto expedition, are inclined to believe that the two fortified village sites described in this article are the remains of the Casqui towns of that period. The "first town of Casqui" had 400 houses,



was situated on the bank of a river greater than the Guadalquivir at Cordoba, and, according to Garcilaso de la Vega, was discovered by the Spaniards from some high hills, but none of the other narrators of the expedition mention any high hills, and according to all the accounts the towns were on a level plain.

That the Spanish force crossed Crowley's Ridge is an undoubted fact, but at what point they struck it, and how far they may have followed it, is not yet known. When we consider that to the southward the point of crossing the Mississippi is still in doubt, and that to the northward the site of Pacaha—the turning point of the expedition—has never been reasonably guessed at, much less accurately determined, it must be evident that to identify towns of the cacique Casqui on the basis of the scanty itineraries extant is at present almost a hopeless task.

As the Casqui towns were all on the east side of a river, presumably the St. Francis, and as the fortified sites described here are not near any stream large enough to be called a river, and are some seven miles west of the St. Francis River, they cannot be considered in connection with the former. A further objection would be the topography, which does not conform to the description of the immediate surroundings of the Casqui towns.

Harrisburg, Arkansas, *March 31, 1893.*

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## WHAT THE MAYA INSCRIPTIONS TELL ABOUT.

D. G. BRINTON, M. D.

MANY a visitor to the Chicago Exhibition last year must have looked with curiosity on the casts from Central America; huge slabs of stone covered with inscriptions carved in strange characters, relics of a vanished civilization which once bloomed on our continent. Doubtless, in many a mind an eager curiosity arose as to what this venerable writing recorded, what story it has to tell, what wisdom it conceals.

An answer is not wholly wanting. In fact, through the diligent labors of half a dozen students in the last ten or twelve years the veil which enshrouded these mystic cryptograms has so far been lifted that we can with considerable assurance say what their general purpose is, what they were aimed to perpetuate in memory, what they tell about.

The steps in this interesting investigation and its chief results, I shall recapitulate.

At the outset, immense aid was derived from a study of the native Maya manuscripts, four of which have been preserved and

published in Europe. These are written in substantially the same characters as the inscriptions, and were evidently by the same people. There was also at hand a complete list of the hieroglyphs for the days and months of the Maya year preserved in a work by Diego de Landa, an early bishop of Yucatan; and the Maya calendar system, together with their numerical signs up to nineteen, were known from later sources.

This modest outfit of preliminary knowledge was enough to reveal that all the manuscripts and most of the inscriptions are largely taken up with elaborate calculations relating to *time*; but whether past, present or future time, time astronomical or time mundane, chronicles of nations or cycles of mythology, remained to be discovered.

Soon, however, it was perceived that the basis of these time-counts was the peculiar ceremonial year common to the native calendar of all the civilized nations of Mexico and Central America, that called by the Mexicans the *tonalamatl*. This contains only 260 days, and is not derived from any astronomical observations, but from purely mythical notions. As the system of this calendar is tolerably well-known from Spanish sources, it was applied to the long columns of numerals and day signs in the manuscripts, with the result of demonstrating that these were intended to adjust the *tonalamatl* to other measurements of time, such as the solar year of 365 days, the lesser cycles of 13, 20, and 24 years, and the greater cycles of 52, 104 and 260 years, all of which were in current or official vogue among the Mayas.

But a discovery by a distinguished German scholar, Dr. E. W. Förstemann, showed that this by no means exhausted the purposes of the calculations. By the application of a series of mathematical tests, he found that the Mayas had an arithmetical system similar to that of the ancient Babylonians, one very simple and efficient in the absence of Arabic numerals. The figures are arranged in lines from the bottom upward, and the value of a unit in each line is twenty times that in the line below it, thus:

3, value of unit, 400, hence.....	3 x 400 =	1,200
2, value of unit, 20, hence.....	2 x 20 =	40
4, value of unit, 1, hence.....	4 x 1 =	4
Total.....		1,244

Further investigation showed that this method was continued indefinitely, subject to a correction required by the relation of the *tonalamatl* period to the true year; that is, that in the third series the unit is calculated at 360 instead of 400.

Applying his discovery, Dr. Förstemann soon found that the Maya arithmeticians were dealing with very high numbers, running into the millions, and that these were days, covering, therefore, very long periods of time. The disposition of some of them was such as to indicate that they were designed as measurements of the apparent revolution of some of the heavenly bodies which we did not know the

natives had observed, as the planet Venus, Mars and Mercury ; others must be intended to correct errors of observation by an indefinite mathematical projection, in which they had been so successful as to determine the exact length of the apparent revolution of the moon to within  $\frac{4}{10000}$ th ; that is, while the true length of a month is 29.530 days, their estimate was 29.526 days, a marvelous precision.

But their chief aim was to reach, by calculation and observation, a cycle or period which would be a common measure, and would therefore bring into natural harmony their discrepant time measures, the ceremonial and solar year, the revolutions of the Moon and Venus, and their various cycles. Such a measure is found in 3,744 years, and this they worked out and prominently inscribed in the inscriptions and manuscripts.

We cannot but entertain a profound respect for the native mathematicians and astronomers who had achieved such remarkable results with such insufficient means. Yet we must not over-estimate their object. It was neither the love of science nor to establish historic epochs. It was essentially divinatory and ceremonial. This is clear from what we can make out of the remaining portions of the manuscripts and inscriptions. These consist of two parts, the one a series of pictures of animals or men, or imaginary beings, the other, rows of characters or letters.

The figures or pictures are chiefly priests, usually masked, divinities and symbolic or totentic animals. Ordinary men and women are generally represented as victims, postulants or captives—minor personages. A number of the scenes have been identified as known ceremonies of the Maya religion described by the early missionaries. There is little or nothing which can be construed as biography or history.

The characters or letters are usually complex, but their elements are not discouragingly numerous, not much over a hundred, I should say. Their seeming diversity is owing to variations in writing or carving them, and in different methods of combining them.

The first questions regarding them are : Are they phonetic or ideographic ? And secondly, in what direction are they to be read ?

The reply to the second inquiry is, that when in lines they are *generally* to be read from left to right, and when in columns, *generally* from above downward. But to these rules are many exceptions, so that every inscription must be studied by itself in this respect, for which a series of rules have been framed.

To the first question, a compromise answer must be given. Many, perhaps most of the characters are ideographic beyond doubt; but, for one. I am certain that some of them are phonetic, and must be translated through the medium of the sounds of the Maya language. They are not alphabetic; that is, they are not letters or phonetic elements like our A, B, C, but represent whole words or syllables, just as do the phonetic elements of the Mexican picture-writing; of which we have abundant examples. They are explanatory of the pictures which are adjacent to them, or of the computa-

tions around them. Like these, they refer to festivals and fasts, ceremonies and auguries, and not to historical events or personages.

This, then, is the conclusion to which modern scholars have arrived. It will be disappointing to those who hoped to reconstruct from these inscriptions and documents the pre-Columbian history of America, or to discover in them the chronicles of nations. There may have been such documents, but they are not among those which have as yet come under the observation of students. We can obtain from those we have a tolerably clear idea of the astronomical knowledge possessed by these peoples, and some acquaintance with their mythology and ritual, but not much more. This is all the story they tell.

This sketch would be still more incomplete than it is, did I omit to mention the names of the eminent scholars, in addition to Dr. Förstemann, who have thrown light upon this fascinating problem. First of Americans should be named Professor Cyrus Thomas of the Bureau of Ethnology, who has supplied a masterful analysis of some of the manuscripts; in France, Professor Leon de Rosny and M. A. Pousse deserve special mention; and in Germany, Dr. P. Schellhas and Dr. E. Seler have ably seconded the researches of Dr. Förstemann. But the field is barely cleared, not tilled; the harvest is yet to be gathered, and no ambitious student need fear that he will be an eleventh hour laborer in the vineyard.

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## MATERIAL FOR ABORIGINAL STONE IMPLEMENTS.

GERARD FOWKE.

**T**HOUGH much has been written concerning the source of supply of the stones that were in common use among the Indians prior to the advent of the whites in this country, there is continually arising a younger generation to whom these things must be told anew.

For all the larger implements, with very few exceptions, and for those that are required for rough usage, as striking or pounding, a tough, hard stone is needed; one that is not easily chipped or broken. Nothing else is so well adapted for this as jade—harder than iron and withstanding blows that will shatter almost any other rock. But jade, unfortunately, does not occur in North America, or at least is not yet known to exist here. True, there has been discovered in Alaska a form that resembles it so closely that some mineralogists insist that it is the same stone; but it differs in so many respects from the true jade found in Asia and New Zealand as to properly fall without the category that includes that stone.



So our aborigines were compelled to seek something else, and the best thing they could find for their purpose was some form of diorite. This varies considerably in color, so that there was room for choice from the artistic side. It is almost as hard as quartz, and the more compact varieties are so firm in texture as to require the use of much patience and strength when an effort is made to secure with a hammer a piece even of so small size as is suitable for a cabinet specimen. Thus, if it were at all plentiful, we would find but little else used for all the different forms of implements and utensils in common demand among our primitive predecessors; unfortunately for them, however, the stone occurs but sparsely away from the mountain ranges, where it has been forced upward from the interior of the earth by the action of subterranean forces, and in the Mississippi valley it is not found at all outside of a few limited areas, except in the glacial drift that has been borne down from the Canadian highlands. Even here it was accessible only in places where erosion had uncovered great quantities of glacial material, and of course these spots were not easily reached by those who lived at a distance from them.

In default of diorite the next available stone is syenite, then granite, and after these comes quartz. These three are more abundant than diorite, occurring plentifully in mountain ranges everywhere, and also widely scattered in the deposits of the glacial period.

When we find axes, pestles, hammers, celts and implements of such character made of stone less durable than those above mentioned, we may know that they were hastily made to meet an urgent want, or that better material was difficult to find, for the rocks that are softer or more brittle than these are but ill adapted for the hard usage to which tools of this class are necessarily subjected.

By this time every one knows, or may easily ascertain, whence are derived all the mica, obsidian, copper, hematite, shells, and even much rarer materials that entered so largely into the ornamentation and trappings of those who were so fond of such things, for there has been no lack of ink and paper used in the exposition of what seems to many people so wonderful and mysterious as that a barbarous race could know where to find what they wanted and how to get it after they had found it. The process was very simple; they discovered surface indications of the desired mineral and dug farther into the ground as it became necessary to find a more plentiful quantity or better quality.

Beyond the glaciated districts, or at such a distance from them that it was not feasible to carry away the denser stones so plentiful there, the natives had to depend upon such things as were more convenient. Shell and bone (including antler) furnished most of their weapons and larger utensils, while for their cutting tools they had recourse in those regions that did not provide a good quality of siliceous rock, to sharpened shell and wood hardened by heat. But there was not the same difficulty about these smaller implements that existed with the larger, for there are few places in the world where may not be found some sort of stone that is well suited

for the manufacture of knives, arrows, drills and such objects as require a sharp cutting edge. On the Atlantic slope and in the mountains facing it there is no lack of amorphous quartz, which, while less fitted for such things than the different forms of chalcedony, afford a much better substitute than anything else at the command of the savage artisan. Jasper and argillite are also very abundant throughout all that region, outcropping everywhere, so that there was no need to make long journeys to obtain it.

In the Rocky Mountains and westward, there is the greatest profusion of agates, petrified wood, chalcedonies, and particularly obsidian, which literally exists by the cubic mile in many of the old volcanic districts. Especially is this true of Mexico and the Yellowstone Park, not to mention hundreds of other localities. Almost wherever found, we can see that the natives had resorted to the spot to obtain it, for the chips and cores are abundant in the vicinity of ledges that are accessible without too much effort.

More interest attaches at the present time to those deposits that are to be found in many parts of the Mississippi valley, for the two reasons that our densest aboriginal population was found here, and that there are so many more collectors of relics than either to the east or the west. Again, those who live amid the stones that have evidently furnished the raw material, see that it was obtained close by, for the outcroppings of the same character of rock as that from which the implements are made, are so numerous as to show at once the sources of supply.

This is not the case between the mountains; here we may travel over many days' journey and never see a single fragment of flint or similar stone, unless it had been carried to the spot where found. This fact naturally excites the curiosity of the collector who has gathered thousands of the worked pieces, and yet has never seen the material in any other form. It will, no doubt, be a surprise to many persons to learn that "flint" in some of its numerous forms is one of the most widely distributed of the commoner minerals, and that ledges of it are very easy of access in nearly all of the Central States. If it possessed any special economic value, this fact would long ago have been a matter of common knowledge, but as the cabinet collector is about the only one who has thought much about it, the duty of locating and studying these places has devolved upon the student of archæology.

There are two principal ways in which flint occurs, one in the form of a stratified rock, similar to the sandstones and limestones that are familiar to every one, the other in the form of nodules or concretions — small, rounded or flattened masses that have resulted from the segregation in limestone rocks of the silica that was diffused through the stone at the time it was deposited at the bottom of the sea. What this concretionary action is, or what causes it, is one of the questions that geologists have not yet succeeded in satisfactorily determining; it is only known that under certain conditions material that is scattered through a stone of different composition has a tendency to collect itself together about some fossil or other

included substance, and continue the process until all the matter of that particular sort within a radius of sometimes several feet has thus become segregated.

Chief among the former is the great deposit in Licking and Muskingum Counties, Ohio, known as Flint Ridge, which for various reasons is the most interesting locality of this character within the United States. As a detailed account of this is published in the report of the Smithsonian Institution for 1884, and also in Moorehead's "*Primitive Man*"; and further, as we hope to be able ere long to pursue some investigations that will settle all the questions that still remain unanswered, no further mention will here be made of the locality.

On the Walhonding River, in Coshocton County, is a smaller deposit, which contains as great a variety of material as is to be found within any area of the size in the country. Some of the stone is the typical chalcodony; some has a closer resemblance to the flint of France than is to be found elsewhere in America; some is a bright, glossy black that breaks with a surface so smooth and lustrous that it seems to have been polished on the wheel of a lapidary. There are also coarser varieties of brownish, yellowish and gray colors, gradually deteriorating into a buhr-stone entirely unfitted for the needs of the hunter dependent upon stone for his weapons. A considerable portion of the stone is covered by a thickness of earth that precludes its excavation by primitive means; but all that part which can be easily reached has been removed, and the earth is scarred in every direction with deep pits and piles of debris that mark the sites of the ancient quarrying.

Flint deposits, some of them presenting the evidences of aboriginal working, are reported as occurring to the northeastward of those just named, but as no one has ever yet examined them with sufficient care to make a detailed statement regarding their character, it must suffice to say that from the geological formation of that region, one should expect to find such deposits within a few miles of one another, although the probability is that none of them will be found to occupy any considerable area, and it may be that such as do exist are not of the character that is sought by primitive workers.

Following the trend or the formations toward the southwestward from Licking County, we find the next worked deposit at New Lexington in Perry County. The flint here presents great diversity in coloration, though not so much in texture; most of it is porous and crystalline, only a small percentage of it, and that in very small fragments, being fit for arrow making. The prevailing color is dark, with more or less admixture of white markings, due mostly to the presence of fossils, which in some places constitute no inconsiderable proportion of the deposit. Not more than one-third of an acre has been cleared out by the old quarrymen, who evidently cared but little for stopping at a place so near to the inexhaustible beds of a superior article at Flint Ridge.

Between New Lexington and the Ohio River, in the same geological horizon containing those above mentioned, there are many small beds that do not seem to have attracted the attention of the Indians; they apparently utilized pieces that were suitable, and could be readily detached from outcroppings in ravines and along hillsides, but there is no indication that quarrying was ever resorted to.

It is necessary to pass westward over the different limestone groups that extend from the Ohio coal measures until we reach the subcarboniferous limestones of southern Indiana before we find other quarries, and we find that the character of the deposits has changed. The regular strata are no longer to be seen, but in their place occur the nodules that pertain to a geological horizon different from that we have above studied. The stone itself is no longer broken and dressed from the bed rock, but the digger attacked the clays that result from the disintegration of the limestone. All the lime has been dissolved by the humic and carbonic acids carried downward by percolating waters which, however, have no effect on the flint, and the nodules are left scattered throughout the clay much in the same order as that in which they occurred in the limestone. Erosion caused many of these to roll down to the bottom of the slopes, and here the Indians found them. But they soon learned that this weathered material was not well suited for their tools, and they began digging in the hillsides for fresh, unweathered nodules. The stone they found there was the hard, bluish-gray hornstone that is more easily chipped and worked than any other form of the silicious rock to be found in the central valleys, and the immense amount of quarrying that has been done in almost every spot where the material is abundant, shows that the red man was cognizant of and fully appreciated the wealth that lay beneath his feet. It is only in the vicinity of the Ohio River that the best hornstone is found; as we go northward the stone gradually becomes coarser, until it passes into a chert that is almost spongy.

It may be well here to correct an error that has obtained wide circulation regarding use of flint from the Wyandot cave. It is stated in many books that the Indians resorted to this cave to procure flint, which they broke into small, angular fragments, carrying the latter into the open air to fabricate into implements. It is true that they did much excavating in the cave at a distance of a mile or more from its mouth, and that they carried the flint to the outside to work it up. But the quarrying was exactly similar to that carried on on the outside; that is, they dug in the clay for nodules, which they tested by striking off flakes, rejecting such as did not suit their purposes. The angular fragments that have been mistaken for the debris of the Indian work, are pieces that have been released from the ceiling of the cave by the weathering of the limestone, and are not at all suited for manufacture. The stratum from which they come is about three inches thick, and the fracture of the stone being at right angles to the line of stratification, produces prisms of a uniform length equal to the thickness of the layer, and varying from the size of a lead pencil to pieces four or five inches square.



The next well-known locality is near Mill Creek, about twenty-five miles north of Cairo, Illinois. Here the nodules are in large, flattened ellipsoids or irregular masses up to two feet in length, and few of them more than three inches thick. The color is gray or yellow. Several acres have been dug over, and there is a mass of chips and spalls near the quarry covering half an acre to a depth at the middle of fully ten feet, where the material has been worked into the hoes and spades that are found so abundantly in all the region within a hundred miles of the mouth of the Ohio. It may be, perhaps, too much to say that all the implements of this description, and having these shades of color, that are found in the area designated, are made of the Mill Creek stone; but no other locality is known from which it could have been obtained.

In many places to the northwest of Cairo, extending beyond the mouth of the Illinois River, are found caches of disks of hornstone very similar to that found in southern Indiana; but when we consider the distance between the two places, it is unlikely that it has been carried so far, especially when we know that the geological conditions are almost, if not quite, identical. Several collectors have looked at different times over much of the territory for the quarries but without success. It is well to suggest that perhaps they are expecting to find excavations on a much larger scale than exists; it is not infrequent to find where thousands of cubic yards of earth and stone have been turned over in the quest for nodules, and yet not a hole remains that could not be filled level with a wagon load of earth. With this hint, searchers may have better fortune in the future.

There also remains to be found, somewhere in the area between the Illinois and the Mississippi Rivers, a large deposit, or deposits, of a very compact white or pinkish chert. From this locality are collected many thousands of beautifully wrought specimens, some of them of large size. It is not to be supposed that the beds of it are very far away. The same flint exists on the western side of the Mississippi, as the same sort of relics are found there; and for nearly a century travelers have made mention of the fact that "Arrow Rock," on the Missouri River, near Glasgow, takes its name from having long been a resort for the Indians, who made arrow-heads from the flint which they obtained there.

Coming to the south of the Ohio River, we find in the lower carboniferous rocks of eastern Kentucky deposits of nodules that have been worked on an extensive scale. This is notably the case in Carter County, in the vicinity of the "caves," while none of the quarries is very extensive; they are numerous and widely scattered. The stone is remarkably diversified in color, presenting many shades of red, brown, yellow and gray, and it has a lustre peculiarly its own, which, like that of the "Flint Ridge stone," renders it very easy for any one familiar with it to recognize it at a glance wherever found. This quality determines the fact that fully nine-tenths of all the flint implements found along the Ohio from the Licking to the Guyandotte are made of flint from Carter County.

The Elk rapids in the Kanawha River just below Charleston are due to a ledge of flint which crosses the stream at this point. The dip of the strata in this region being to the westward, the stone gradually rises as we go eastward, reaching the tops of the hills a few miles east of the mouth of the Gauley River. Over this entire area the flint is in a solid stratum about four feet thick, and the outcrop can be followed in its tortuous windings along the hillsides for hundreds of miles. On following up almost any small ravine to the level of the flint, the latter will be found projecting like a shelf, sometimes with a width of twenty or thirty feet. For this reason there is no evidence of aboriginal excavations; when the Indians wanted flint they had only to go to the bed of a ravine and pick up suitable pieces that had broken off; or if they found none suitable it was only necessary to go to a ledge and break off a piece. That they used it in quantities is sufficiently shown by the great numbers of wrought pieces found scattered in all the tributary region, and by the numerous little patches of chips on almost every level area along the streams.

In southwestern Virginia and eastern Tennessee, flint arrowheads are abundant, made of a translucent or even transparent flint that is sometimes almost pure chalcedony. The native stone, judging from the pebbles found in the streams and from the size of the worked pieces, must occur only in nodules, few of which exceed two inches in diameter; and it is probable that although the material may exist in large quantities, it is so scattered through the parent rock there are no quarries to be found, as its sparseness would render impossible the task of procuring workable quantities by digging.

There are several points in the Alleghenies, in Virginia and West Virginia, in the devonian limestone that is found there in massive beds, where flint exists in such quantities as to hide the ground. Many of these fragments when freshly broken from the native ledge are suitable for working, and were largely used by the Indians; and there are a few places, notably in Highland County, where aboriginal quarrying has been carried on to a large extent; but there is nothing in any of these localities that is of especial interest.

In the cavern limestone of western Kentucky, comprising as it does nearly all the western end of the State, chert and hornstone exist in the greatest abundance—in many places tracts of hundreds or even thousands of acres, are in large part difficult or impossible of cultivation on account of the fragments covering the ground, or the masses that project above the surface, too intractable to be reduced even by the elements. In Todd and Christian Counties the stone is in nodules resembling in every respect that about the Wyandot cave, and the quarries are numerous, though not extensive. The flint to the east and the west of this area does not seem so well adapted to arrow making, and although it sometimes forms the only visible rock on the surface, there are no places where digging seems ever to have been attempted. The stone is very brittle, and shatters instead of flaking.

There is some place in western Tennessee where there has been a great amount of ancient quarrying, and of a superior quality of flint for the manufacture of celts and other large implements. Some of the finest pieces of Indian workmanship in this material come from that vicinity, but no one seems yet to have ascertained the exact locality of the deposits. Implements made from it are found as far south as middle Mississippi, but their greater abundance in Tennessee points to some limited portion of that State as the source of the raw material.

The novaculite of central Arkansas has furnished the natives of that region with a high grade of stone, as it is easily chipped, has a clean fracture with sharp edges and keen points, and is easily mined. The color varies from a red or pink to a bluish-gray. A coarser variety of the same stone, familiar to us as the oil stone or hone-stone, which is pure white when first quarried, was much used for the manufacture of small celts and ornaments.

In the northeastern part of the Indian Territory are massive deposits of compact white chert that has been extensively quarried. It was used in the fabrication of large implements, worked pieces a foot long being not uncommon. The cores and flakes that result from splitting the massive rock with stone hammers, have a greater resemblance to those from France than is found among the refuse from any other American locality. The stone is not, however, susceptible of the delicate work that renders possible the small, well-executed arrow-heads of most of the nodular flint.

Many other localities could be given, but these are the principal, and are sufficient to prove that our copper-colored predecessor need give himself no uneasiness as to what he would do for weapons when he had shot away those he had; there was never any question as to how or where he could replenish his quiver.

NOTE.—The Editor of THE ARCHEOLOGIST would be glad to receive communications from all into whose hands the Journal may come, concerning deposits of any character—flint, mica, steatite, in short, all the minerals that were made use of by the aborigines in the manufacture of implements or ornaments of any sort. A description of each mineral with its geological position should be given when practicable. Especially is it desired to have the localities of any flint quarries not mentioned in Mr. Fowke's paper.

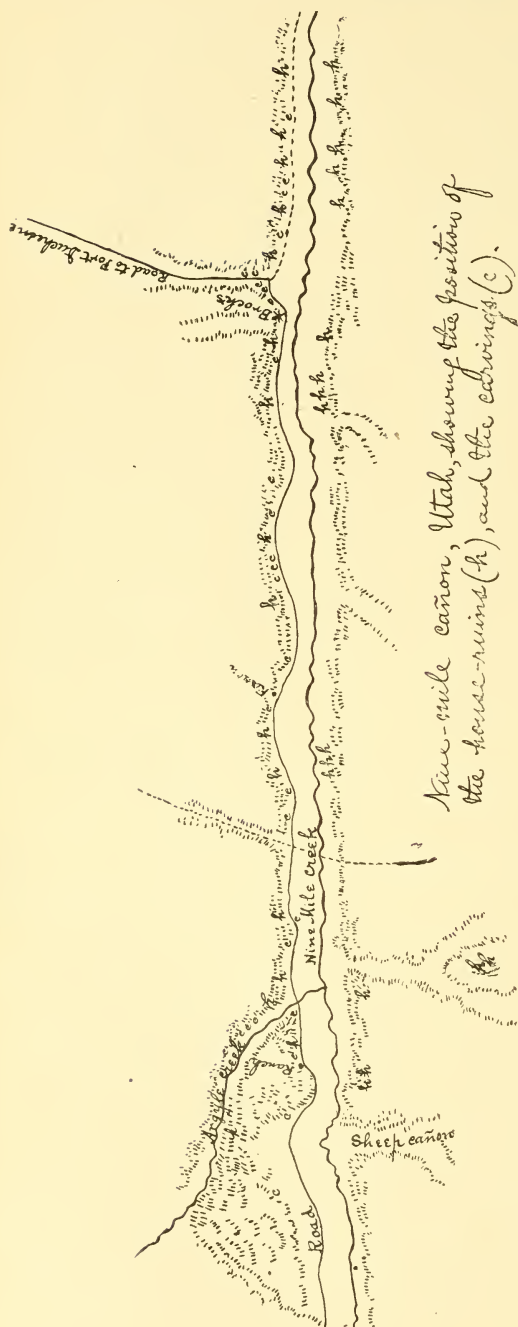
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## PREHISTORIC MAN IN UTAH.

HENRY MONTGOMERY, M. A., B. SC.

(Concluded.)

HAVING dwelt for a brief space upon the character, condition and extent of the remains of prehistoric man in the valleys of Utah, let us now turn to the lofty peaks and perpendicular cliffs, and we shall find abundant evidence of the existence of the same race of human beings.



EMERY COUNTY RUINS.—Reference has already been made to the *atlal*, mummies, skulls, flails, pipes, sandals and other relics of the cliff caves of San Juan County. Perhaps an account of some of the remains of the peaks and cliffs of Emery and Carbon Counties may also prove of interest. From Price, on the Rio Grande Western Railway in the summer of 1892, a drive of fifty miles over a dusty and uninhabited country, brought me to what is known as "Nine-mile" Cañon in Emery County, near Uintah. Nine-mile creek, a tributary of Green River, runs easterly through this cañon, with mountains and high cliffs on both sides of it. On the peaks and on and in the cliffs are numerous remains of prehistoric people. Although I am inclined to the opinion that they are all of one race, yet I think this has not been fully established. They consist in general of house ruins and rock carvings; but the latter are separate from the former, and usually occur high up on the faces of perpendicular cliffs and at some distance from the houses. There are likewise a few paintings of a character very different from that of the carvings. Tooele, Millard, Sevier, Iron, San Juan and other counties possess rock carvings of the same general character as those of Nine-mile Cañon, differing only



in minor respects. Amongst the drawings made for me by Sergeant P. Bartsch, to whom I am indebted for assistance in my investigations in Nine-mile Cañon, may be seen those of human feet of various sizes, as well as some of the whole human body, all cut, at remote dates, in the vertical faces of the cliffs, and most of them at great heights above the present bed of the cañon. In Millard County have also been found carvings of human feet, some of which are larger than those that occur in Nine-mile Cañon, being each ten inches in length. At one spot they were discovered upon the upper surface of a large rock, and so close a likeness did they bear to the average human foot impression, that they were unhesitatingly reported as genuine human foot-prints that had been made ages gone by in the lava rock when the latter was in a molten condition. To dispel this idea, in addition to the fact that similar foot carvings occur high on the faces of the perpendicular cliffs of Emery County and elsewhere, it is necessary only to state that upon the surface of the same rock, side by side with the same so-called human "foot-prints," there have been found numerous carvings of the usual kind so common throughout Utah and vicinity. Having made careful examination of the Millard County "foot-prints" and associated carvings, and having several samples of them in my collection, I may be permitted to express my opinion on this question with some degree of confidence. In this instance all the carvings are greatly weathered, and the huge rock itself is but a bowlder that has, at some distant period in the past, been removed from its original position and carried to a distance.

But I must return to Nine-mile Cañon. A majority of the remains are on the north side of the cañon, and have a pleasant, sunny, southeasterly exposure. Some of the ruins are those of dwelling houses, others are of storage bins, and others appear to have served the purposes of lookout and signal stations. A careful exploration of many of them afforded conclusive evidence of three classes of structures. The dwellings are distinguished by their situation, their large size, the fire-place and contents, and, as a rule, also their smoothly-finished interior. The bins or storage structures are too small for human occupation, and they contain stone corn mills, corn sacks, and often considerable quantities of corn, shelled and unshelled, as well as gourds and water tanks. The storage bin either forms a compartment of the dwelling house or it is separate, and at a convenient distance from the dwelling.

There is a most prominent peak, consisting of an overhanging, natural, hard rock tower situated upon the top of an exceedingly steep and rugged hill or mountain immediately to the south of "Taylor's Ranch," in Nine-mile Cañon, Emery County. It took Sergeant Bartsch and myself most of one forenoon to make the ascent of the hill, and the descent proved more difficult than the ascent. The rock tower is about fifty feet high, and standing in an almost inaccessible spot it commands a magnificent view of several cañons and mountains. On its very top, in an extremely dizzy situation, were the remains of three small stone circular structures, two of which were provided with roofs of heavy cedar logs and heavy, flat

stones. The logs and poles of these two structures would make about a cord of wood, and they possessed distinct marks of the rude stone axes with which they had been cut into suitable lengths. I obtained some heavy and well-made stone metates, some corn-cobs and fragments of other relics from these ruins. The metates were made of a kind of sandstone different from any to be seen upon the hill; therefore, it would seem that they must have been carried from a distance, and if so, it must have required a considerable effort to



Rock carvings on face of cliff in Nine-mile Cañon, Utah.

transport them up to the place in which we found them. One of these metates had been worn completely through by use in rubbing or grinding.

In the south side of the same rock-tower we found a fourth stone-house filled to the roof with the accumulations of the many years that must have passed since its owners ceased to use it. These accumulations consisted chiefly of the excrement of bats, along with some decayed Piñon pine leaves and nuts. As the whole heap was about four feet deep, it must have taken a long time for it to accumulate. I judged, also, that it must have been a long time since it became so full that not even a bat or a bird could find room within it. This



structure was about four feet wide, five feet long and four and one-half feet high. Its careful working yielded a small quantity of interesting relics, such as corn-cobs, a portion of the horn of a buffalo, also some buffalo hide, pieces of glazed and painted pottery, and small articles manufactured from bone, all being found upon the floor of the house. One corn-cob was in good condition, and exhibited distinct marks of having had the corn removed from it by a knife in a manner similar to that in which it is frequently removed at the table of civilized man. There were also evidences of the existence of a fire-place, thus indicating that the building had formed at least a temporary dwelling house.



Stone structure on a peak in Nine-mile Cañon. Explored by H. Montgomery in June, 1892.

On the south side of the cañon, and about a mile from Brock's Post-office, I explored a strong and well-built stone structure, which stood upon a high and precipitous cliff. It formed about the two-thirds of a circle, being fourteen feet long, twelve feet wide and five and a half feet high, and was completed by a cliff in its rear. The wall was remarkably smooth and regular on its inner side, but was slightly irregular externally. It possessed a doorway or entrance on its eastern aspect thirty inches in height and twenty-seven inches in width, and a loose, flat stone slab served as a rude door. This wall

was thicker below than above, and externally it sloped gently inwards from the bottom up, its average thickness being about eighteen inches. Its situation and structure, together with the absence of a roof and of the remains of domestic articles, afford evidence that it served as a signal or military station.

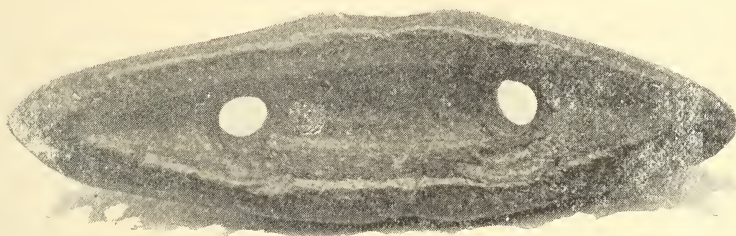
At three o'clock in the morning of a long and bright summer's day, my saddle-horse and that of my assistant stood at the door of the ranch house in readiness to carry us to the top of a peak some two miles distant, and upon which was a natural column of rock bearing prehistoric ruins. We soon mounted our steeds, forded the stream, and began the toilsome and dangerous ascent of the mountain, stopping to rest our sure-footed animals more and more frequently as we ascended. At length, after about three hours' continuous climbing, we reached a spot where we were obliged to abandon the horses and make the remainder of the trip on foot. In a short time we came to the rock column, which, although hard and solid, was much disintegrated, and had been vertically cleft and separated, leaving a dangerous gap between its two inclined and overhanging portions. By the aid of cedar poles we succeeded in clambering to its summit, and there, in a situation that commanded a magnificent view of many cañons and hills, we found the ruins of four circular stone structures, which, in my opinion, had once formed a lookout and signal military station. They were arranged upon the flat top of the rock in such a manner that three smaller ones, each capable of holding but one man, occupied the front and most exposed places, one of them being in advance of the other two, which were nearer the sides of the rock. The fourth and largest stone structure held a place several yards in the rear of the three small ones, but from it a clear view of a wide and extended tract of country could also be obtained. They were all destitute of openings except at the top, and their walls sloped inwards from below, so that the opening in each of the three small structures was small, and only sufficient to allow the entrance or exit of one person. Utah, being on the outskirts of the country occupied by a great nation whose headquarters were probably in Mexico, might properly be expected to be provided with a considerable number of military posts or watch stations such as those herein described. There is no evidence that these structures were used as either dwellings or store-houses; but both of the latter occur at lower elevations, and in the neighborhood of the lookout stations.

Besides the ruins aforesaid, I explored many others in this cañon. One of them was simply a small natural cave in the face of the cliff, improvements having been effected by the addition of mixed mud in several parts of it. From another house ruin the skeleton of a typical Cliff Dweller with flattened occiput was taken at a depth of five feet beneath the floor.

Some fifty miles southwest of Nine-mile Cañon, and within a few miles of the town of Price, there is a little stone and adobe house in a natural cave well up in the face of a high, perpendicular cliff. It was explored by me in June, 1892. This little building is nearly circular, and about three and a half feet in diameter and four feet in



height. It may be seen towards the left of the observer and near the centre of the sloping bottom of the cave, and may well be likened to a large bee-hive or swallow's nest. A dark, irregular opening appears in the front of the house, but this was probably not made there originally. It seems to be a recent break in the front part of the semi-circular wall, the original opening in this bin or enclosure being about ten by fifteen inches in size, and still in a perfect state of preservation in the center of the roof. The top or roof is flat, and has the aforesaid rectangular small opening carefully built in it, the entire roof consisting of well-woven wooden poles and bark with a heavy covering of adobe or mixed mud, which shows undoubted evidence of having been in a plastic condition at the time it was placed upon the poles. Not only are the slender poles imbedded well within the overlying adobe, but the large finger marks of its builders are



Stone shuttle found on surface of ground near ruins from which thread was exhumed in Iron County, Utah. Actual size.

numerous and distinct upon the outer surface of this adobe. In this structure or bin were found two pieces of cast iron, evidently the feet or supports of what had once been a cast-iron pot or kettle. While this is an unusual "find," and may have an important significance, standing alone and without similar additional "finds," it is uncertain what value should be attached to this discovery. This structure is situated more than one hundred feet above the base of the cliff, and nearly two hundred feet from its summit. Besides this, there were the greatly dilapidated remains of two other small houses within the same natural cave, and one larger house, probably a dwelling, having metates and other remains. Near by in the same region, I discovered other caves which possessed remains of former houses that must have been very similar in character to the one just described. From these I obtained large stone metates or corn mills, as well as corn-cobs and other relics. Among other things a bag or sack-like basket was taken from one of them. It contained a small quantity of shelled corn, and with it was a heap of well-preserved corn-cobs, probably more than a bushel altogether. This sack is about twenty-two inches in length and seven inches in width, and is tied at each end by a bark cord. It is made of rushes and cedar bark, the fibres of the latter having been manufactured into a thick cord. Two ropes or cords of twisted cedar bark fibres pass around each rush stem, one on each

side of the rush, the latter extending lengthwise, while the cedar cords run transversely.

From the preceding account of my explorations in Utah the reader will, doubtless, experience little difficulty, if any, in reaching the conclusion that the human beings who formerly occupied the valleys of this region were of the same race as those who occupied the cliffs and peaks, and that the date of the occupation of the one must have been the same, or nearly the same, as that of the other. The Cliff Dwellers and valley residents were contemporary, or nearly so. The material and style of the pottery of the valley people, the opening and entire structure of the house roof, the finger marks, the metates and rubbing or grinding stones, bone awls, broken bones of animals, corn, gourds, skulls and small store-bins, are all similar to those found in and about the cliffs. That is to say, the buildings, articles of workmanship, and the human and animal remains of the valley ruins are in all essential respects similar to those of the cliff



Prehistoric carving on vertical cliff  
in Nine-mile Cañon, Utah.

ruins. The similarity is indeed most striking. One is unable to distinguish the pottery, the stone grinding mills, the bone ornaments and tools, and the roof structures of the cliff and valley ruins. That they belong to the same people cannot for a moment be questioned. A person has but to glance at them to feel sure of this. The only differences noticeable are—the valley relics are more altered and decomposed than those of the cliffs, and the buildings nearly always consist of adobe and mud, while those of the cliffs and peaks consist very largely of stones. These differences are natural, and to be expected. The greater amount of moisture held by the valleys fully accounts for the greater alteration in their remains.

With regard to the second difference it may be observed that the higher one climbs, the more stones and the less mud and adobe are found in the cliff buildings. This is, of course, because of the difficulty of getting mud for these structures. And so with respect to the valleys. The building material is in the vicinity in each case. Stones occur in the cliffs and clay in the valleys. In many instances, however, mud was carried up to great heights and used in the construction of the walls and roofs of cliff houses in the same manner as in the valley houses. Both the cliff and the valley people erected permanent buildings, and in much the same manner; both manufactured pottery of similar material and patterns, and both of them planted, and by means of irrigation, raised crops of similar kinds. They were one and the same people, occupying the valleys and mountains of Utah, Arizona and Colorado during the same period of time, which was undoubtedly of long duration, adapting themselves to the surrounding and changing conditions of nature.

# THE ARCHÆOLOGIST.

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## EDITORIAL.

A NUMBER of gentlemen have written to the editor, and asked his opinion as to what Archæological society they should join. He advised them to enter the American Association, the Anthropological (Washington) or the Ohio Archæological. Several replied that the expense connected with such societies was more than they could afford.

The Editor takes this opportunity to speak a word for a new and growing institution, the Ohio Academy of Science. Its dues are but \$1.00 per year, and there is no initiation fee. It is devoted to Botany, Geology, Zoology, Biology and Archæology. It holds a winter meeting in Columbus

once a year, and a field meeting at such points in the State as are agreed upon. Like the Indiana Academy of Science, its work is not confined to Ohio, only in name is it limited to the State. It enters upon its third year with a membership of nearly one hundred and fifty. It publishes a creditable report. Collectors and students will find it a help to them; the dues are not large. Its aim is to promote science, whether archæologic or geologic. The President is Prof. Frank Webster, of the Ohio Experimental Station, Wooster. The Secretary, Prof. W. G. Tight, Granville, Ohio (Denison University). Any one sending Professor Tight \$1.00 will be enrolled as a member. The Editor recommends the Society to all readers, and especially to those who belonged to the former American Archæological Association. Join the Ohio Academy and aid in preserving and studying ancient remains.

FRAUDS have broken out again. This time they hail from Iuka, Miss. However, THE ARCHÆOLOGIST will say but little about them. The information is only general, and those who give it are hardly specific in the charges. THE ARCHÆOLOGIST will take pleasure in exposing all frauds. That is a part of its mission, but it wants collectors to be very positive in charges, and to make them properly in writing, so that if legal complications arise the magazine will be safe.

THE Editor wishes collectors to co-operate with him in the Collector's Department. He wants



articles, short or long, describing interesting specimens in the cabinets of readers. He wants collectors to discuss the use, etc., of implements and weapons. Send him any information you may think of interest.

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### BOOK REVIEWS.

"Certain Shell Heaps of the St. John's River, Florida." C. B. Moore, Philadelphia.

A continuous series of papers originally presented in the *American Naturalist* of '93 and '94. It is as timely as Mr. Moore's other reports, and handles the subject as clearly. The book treats of mounds "hitherto unexplored." The author reviews the work of Professor Wyman, the first scientist to examine the shell heaps. He concludes that a large tract of country, lying between Lakes Washington and Monroe on the St. John's River, should be examined, and with a large force of men he spends several winters in the region. He finds that the shell heaps are very extensive. For example, at Bluffton Grove, there are thirty acres covered by shells. He says:

"The shell heaps of the St. John's are refuse heaps simply, and in them refuse alone can be expected under ordinary circumstances; but as articles of value sometimes find their way into ash heaps and dumping places at the present day, so, at times, do weapons and implements, unbroken and in good condition, come to light in the shell heaps."

"Stratification in the shell heaps is a matter of accident."

Mr. Moore explored 43 mounds and heaps. He finds the bones of dogs among the refuse, and concludes that as dogs were seen (in 1527) by the Spaniards, these animals could hardly have been introduced by Europeans. Dr. Dall thinks the covote has been domesticated, from earliest times, along our southern border.

Mr. Moore suggests that the shell mound people were cannibals. He thinks the shell heaps were abandoned in pre-Columbian times.

The collection which he made is on exhibition in the Wagner Free Institute of Philadelphia. The book is a worthy contribution to Archæological literature.

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"A Journal of American Ethnology and Archæology." Vol. IV. Houghton, Mifflin & Co., Boston. \$2.00.

Messrs Cushing and Fewkes can be justly considered to be the best posted Ethnologists with regard to the pueblo tribes of of the Southwest. Dr. Fewkes has issued the fourth volume of his journal, and while in point of popular interest it may not rank as high as one or two of his other publications, its value to careful students cannot be over-estimated. The volume is dedicated to the memory of Mrs. Hemmenway, and is entitled: "The Snake Ceremonials at Walpi." Mr. A. M. Stephen and J. G. Owens are named on the title page as assistants. There are thirty-five good illustrations, five of which are full page plates, two being colored. Space does not permit us to speak fully of Dr. Fewkes's report on the dance. The following is one of the most remarkable parts of the ceremony:

"In the performance of so many uncanny rites, it is hard to say which was the most remarkable, but that which followed was certainly the most sensational. The snake priests in their kiva had handled the venomous reptiles with abandon, but now began a scene unparalled in any of the rites of these primitive people. The snakes, which up to this time had been left in the *ki-si*, were now to be publicly brought out and carried about the plaza. The snake priests divided into groups of three each, called respectively the carrier, hugger and gatherer, according to their different functions. These trios gathered in line near the entrance to the *ki-si*, and the carrier knelt down in front of it, extending his hand inside while the hugger lifted the carrier's



foxskin and stroked its back with his whip. As the carrier rose he held a venomous snake. Without hesitation he dropped his *pa-ho* and placed the writhing animal in his mouth, grasping its neck with his teeth or lips. He closed his eyes, and the hugger placed his left arm about the carrier's neck. The reptile was so held that its head pointed towards the right, and the hugger brushed his whip before the serpent's mouth to shield the carrier's face. Both men then started to make the circuit of the plaza in a sinister direction, closely followed by the gatherer, who picked up the snake if it were dropped. A second trio followed the example of the first, and soon the plaza was filled with priests engaged in this way. It was the intention of the participants to carry the snakes around the whole circuit, but several fell by the way, and thus arose a series of exciting episodes. Here a rattlesnake, dropped on the rocky plaza, coiled to strike its carrier, but was quickly picked

up by a more experienced priest; there a swift-moving house snake made its way from its captors among a number of spectators standing on the edge of the mesa."

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"North American Bows, Arrows and Quivers." Otis T. Mason. Smithsonian Report, 1893. Reviewed in December.

"Children's Singing Games." Alice B. Gomme. Illustrated by Winifred Smith. Macmillan & Co., New York. \$1 50.

A large collection of verses accompanied by music illustrating the street games of London children and the country plays of English speaking young folk. The value of the work lies in the beauty of the illustrations and the good print rather than in its worth as a contribution to scientific folklore. Its tales will be read and sung at many firesides, and while the songs and games will please children, adults may gain information from the remarks of the author. It is well worth a place in any household.

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## COLLECTOR'S DEPARTMENT.

### INFORMATION FOR COLLECTORS.

#### Hematite.

As the word "flints" has come to be used as a generic term for all the numerous shapes and sizes of objects made from the various forms of chalcedony and allied material, so the name "hematite" is being adopted for the many implements, utensils and ornaments made of this form of iron ore. Limonite, the brown or yellow ore, which differs from hematite in having a small amount of water in its composition, is popularly and not improperly placed in the same division; but the use of this, except for material from which to make paint, is quite rare—not from any scarcity

of the substance, or particular difficulty in obtaining it, but because on account of its softness it is less fitted for the purposes to which such things are applied.

Hematite is found in various portions of the country, occurring both as a massive deposit, and also in concretions or nodules. The former is most abundant in rocks of the earlier geological periods, as in the Lake Superior region and about Iron Mountain, Missouri, while the latter form is found largely in the sedimentary or stratified rocks of a later time.

In the Ohio valley it is rather plentiful, so far as aboriginal needs are concerned, in the coal measures of southeastern Ohio and West Virginia, weathering out of the ore-bearing strata in small nodules that are

very hard and compact, as well as in large pieces that are more brittle, and contain varying amounts of softer or earthy matter. Like limonite, the latter pieces were of small value to the Indian except for making "paint stone."

There are a few grooved axes, and occasionally some other objects of utility or ornament made of this material, but aside from these the four principal types that include the vast majority of hematite manufacture may be classed as celts, plummets, cones and hemispheres. The first are so called from their resemblance to the stone implements thus designated, though a much better name for them would be knives or scrapers, as they were used almost entirely for the purposes to which we would apply such tools, and are but poorly adapted for any other use. Almost without exception they were mounted by setting the point, or end opposite to the edge, in a handle of bone or antler, which would be tough and strong, and at the same time easily worked; this could be held in the hand in such a way as to allow the edge of the "celt" to be used as a knife by drawing it toward the user, or as a scraper by being laid flat and pushed the other way, as our modern carpenters use a plane. In the first use, hides could be stripped from the flesh of animals, joints could be divided, meat cut up for food, rawhide or buckskin cut into strips, etc., while handled in the latter way the primitive artisan would have an implement for scaling fish, cutting the flesh or callosities from hides that were being dressed, splitting sinews, shaving to the proper thickness wood for various uses, and other things that would seem to us clumsily done by such means, and yet finding no easier solution with the appliances at the command of the savage artisan.

As to the "plummets," so named from their resemblance to the implements in use by modern brick and stone masons, the only thing we can say with certainty is that the name is wrongly applied; for while the modern "plummet" is used almost alto-

gether in building operations and in surveying, the more ancient form of the implement could never have been thus used for the very good reason that the persons who made them never did any building or any surveying, so far as can be learned from the researches of the two or three persons who have ever tried to find out from the Indians the purposes to which these specimens were applied., it would seem that they were used only in some form of incantation that would be useful in producing rain. This topic is familiar to readers of *THE ARCHÆOLOGIST* from a paper which has recently appeared in its pages. Nations or tribes, as well as individuals, of moderate degree of culture, attach great importance to the external forms of religious observances, and there are many things that find their way into the cabinet of the collector to which the name of religious or ceremonial objects can safely be given, so long as we do not attempt to determine therefrom the particular style of pietistic observance that is denoted by their probable use.

And with the latter part of this explanation we must dismiss the "cones" and "hemispheres" that form a large part of the bulk of hematites that are included within our classification; we cannot imagine any utilitarian purpose to which they may have been applied, and so we must rest content for the present with calling them religious, ceremonial, emblematic or some other name that will sound well without meaning anything; trusting to the observation or acumen of future workers to amplify these terms into something that will have for us a more definite meaning.

GERARD FOWKE.

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Mr. V. Sosnovec, of St. Louis, writes the Editor that he has the smallest hematite axe in the country. It is a very little less than an inch in length and weighs 85 grains. Other collectors must surrender the blue ribbon to Mr. Sosnovec. His is the smallest axe on record.

### Antiquities of Western Missouri.

The writer has personally examined, although not yet thoroughly explored, the bluffs and bottom lands along the Missouri River in Buchanan and Platte Counties, Missouri, and I found many evidences of a pre-historic population, especially along Sugar and Bean Lakes in Buchanan County. Every ravine running back from the lakes in the bluffs presents some indications of aboriginal occupancy, and almost every bluff is crowned with a mound or a group of mounds. It seems that these former inhabitants selected no particular location for their *tumuli*, as some are on the tops of the highest bluffs, others on the benches or terraces of hills, and some have been found even on bottom lands. I find upon examination that these mounds present no contrast whatever, but they are all exactly similar in both construction and contents. On the old Major Bean farm are a number of these mounds. Some of them are less prominent than others, having been reduced by the action of the elements; the average size is about twelve feet in diameter at the base and about two feet high.

The writer explored two of these mounds on the Bean farm. They were situated on the bench of a high hill which faces the river bottom. A deep ravine extends toward the bottom just south of the mounds. The slope which descends gradually towards the ravine, is the site of an old aboriginal workshop, as numerous chips of flint and broken implements are found here. Excavations in these mounds revealed the fact that cremation had been practiced among the people who constructed them. The human remains unearthed were badly charred, and were scattered about promiscuously through the mounds. From the large quantity of bones exhumed it was evident that several bodies were deposited in one mound. The bodies were probably cremated and then piled up irregularly, and a mound built over them. The remains were not more than a foot below the sur-

face, but before coming in contact with them a layer of burnt substance resembling brick or ballast had to be penetrated to the depth of several inches. This burnt layer extended over the whole base of the mound. There was a layer of common surface limestone on top of this burnt substance intermingled with black loam. These stones had been carried here, as there is no stone on the hill on which the mounds are situated. The bones were so badly charred that unless the earth over them was carefully removed it was impossible to obtain a piece of any size. The pieces of skull removed seem to have been of unusual thickness, and the other bones were quite large. A large human skull which had been washed from an adjacent ravine was found some time ago. This would indicate a burying ground. A large pair of elk antlers and a buffalo skull were also found nearby in a creek bed.

Near the mouth of Sugar creek is the remains of a village of these early people, and many relics have been picked up in the fields. The present village of Iatau further down the river in Platte County, also presents evidences of having been a favorite camping ground of the aborigines. Many mounds are located in the vicinity. There are a number on the farms of Bud Smith and James Palmer. One of the mounds on Mr. Smith's place is in an open field on the summit of a commanding bluff, and it is quite prominent. Some of these mounds have been plowed over for years, and consequently have been greatly reduced; some of them almost obliterated. A large fragment of pottery nearby the entire bottom of a vessel, was plowed up near a mound in Mr. Palmer's field in the bottom. A great many stone axes, hammers, arrow points, etc., have also been plowed up by different farmers in this vicinity. In digging wells, cellars, and in making various other excavations at Iatau, human bones are frequently found, some of them at a depth of twelve feet. Along the Missouri lakes was once a great hunting ground,

where an abundance of deer, buffalo, wild turkey, elk and fish could be obtained; and such a place always attracted the red man.

GEO. J. REMSBURG.

### RECENT DISCOVERIES.

More discoveries have been reported the past month than ever before. The Editor finds it impossible to notice them all, as he has at present writing upwards of one hundred piled up on his desk.

J. R. Davis found relics and bones in a mound in Huron County, O.

A mound was opened near Crystal Lake in Michigan, and a "Doctor" present (who ought to be, professionally, above lying) reported the skeletons in it as nine feet in height. Will wonders never cease?

A beautiful temple was recently found in Greece. It is 131 by 67 feet.

Major J. G. Pangborn of the Field Columbian Museum and several assistants left for a trip around the world. The trip is largely one of pleasure, and will cost from \$80,000 to \$100,000. The money could be much better spent here in America and Central America. It is a shame to so divert the funds of the museum.

More discoveries among the ruins of the Hittites in Palestine.

Halran I. Smith made important discoveries in mounds near Saginaw.

French and Indian relics found at Wolcott, N. Y.

Tomahawks, beads, bones and celts found at Attleboro, Mass.

The *New York Sun* ought to have known better than to print a silly article recently, entitled, "Did the Toltecs Make Coal?" It was worse than Doughty's pamphlet

A bronze sword found in Mexico on the site of ruins has stirred up much discussion. It is impossible from the accounts to tell whether the implement is copper or true bronze.

Valuable discoveries were made by Dr. Peters near Babylon. Thousands of inscribed bricks and tablets were found.

Ruins at Xochialco, Mexico, were fully described in the *San Francisco Chronicle* recently. The writer, an intelligent Mexican gives a complete account of one of the most remarkable structures in the land of the Aztecs. The ruin is 88 by 104 yards on top. He does not give the dimensions of the base.

Mounds opened near Mandan, N. D., yielded a rich collection of stone, bone and pipestone relics. From the description, one would think them to be rather modern, say within the past 200 years.

### ANTIQUITY OF THE HUMAN RACE.

#### RESULTS OF AMERICAN EXPLORATIONS AT THE RUINS OF NIFFER.

WASHINGTON, Sept. 13. — The Department of State has received a dispatch from Minister Terrell at Constantinople announcing the results of American explorations now being conducted at the ruins of Niffer, near ancient Babylon. The expenses of the work are defrayed by an association of Philadelphia gentlemen formed in 1888, under the name of the "Babylonian Exploration Fund." The work began in 1886, and except at occasional intervals, has been actively conducted. Dr. Peters and Prof. Heilprich of the University of Pennsylvania, began the work, and it is still continued by Dr. Peters. From 150 to 250 Arabs have been constantly employed. In the number of tablets, bricks, inscribed vases, and in the value of cuneiform texts found, this American enterprise rivals, if it does not excel, in the opinion of the Minister, the explorations of Layard at Nineveh and Rassam's excavations at Abu-Hatba. Dr. Heilprich remains at the museum in Constantinople, at the request of the Turkish Government, translating inscriptions and arranging tablets, bowls and vases used from one to four thousand years before



Christ. Many tons of tablets, etc., have already been secured, and the enterprise has revealed an antiquity for the human race nearly ten centuries older than had before been acknowledged by Biblical students. The report of the Minister is very long and full of details to archæological students.

### INDIAN PIPES.

In the interesting article on pipes in the September *ARCHÆOLOGIST*, one fine New York type is omitted. I have figures of a number of these, but they have not yet been published. They are of the curved trumpet form, but covered throughout with grotesque faces, partly in bold relief. One has five and another four around the rim of the bowl, and they intertwine all the way to the mouthpiece. The latter pipe has fourteen faces remaining, and probably had at least twenty in its complete form. These are confined to one or two village sites of the end of the sixteenth century,

My deer horn pipe was not *found*, but originally obtained of an Indian. Mr. Adams' fine bird pipe is now in Mr. Douglass' collection. There are others as good, and even more curious. Among the latter is one with a panther's head on the bowl, but turned to one side. Early Indian pipes usually had the ornament facing the smoker, but a reversed practice came later.

As regards the pipes which Hudson saw, his statement is explicit, and they could hardly have been catlinite, as that was not known in New York much before the year 1700. The evidence on this point is clear. Metallic pipes, however, were also used later. I have figured several of pewter, brass, and even iron, all of European patterns. My horn pipe has the bowl lined with a thin piece of iron.

Tubes of stone are frequent in New York, some of them so soft as to suggest clay. The longest I have figured is nine and one-half inches, and is of sandstone. They

are often of striped slate, and vary in form greatly.

I may add that the New York Indians still raise their native tobacco, *nicotiana rustica*, which has a yellow flower. This has sacred uses.

Scarcely a type of tobacco pipes has ever been described which has not its representative in New York, perhaps brought there by travellers, captives or conquerors. The Iroquois themselves were notable pipe makers, working at first in clay and later at times in stone. Most stone pipes here however, are older than those of clay.

W. M. BEAUCHAMP.

### MORE INDIAN RELICS.

FIVE CANOES SAID TO BE AT THE BOTTOM OF HATCHET POND, SOUTHBRIDGE, MASS.

The finding of an Indian canoe in the waters of Hatchet Pond, near Southbridge Mass., a week or two ago, seems to have whetted the appetite of curiosity seekers. Thursday a reporter was shown an Indian spade, a war club, tomahawk and a half dozen arrow and spear heads, all made of stone, taken from that section. The pond on account of the constant drain, is remarkably low now, and it is said that five more canoes can be seen at its bottom. They are, however, considerably rotted, and are not considered to be worth preserving.

### TO EXPLORE PAPAGORIA.

PROF. MCGEE AND MR. DINWIDDLE LEAVE ON AN INTERESTING MISSION.

Prof. W. J. McGee and William Dinwiddle, of the Bureau of Ethnology, left Washington to-day for Tuscon, Arizona, from whence they will explore the desert country of the southwestern portion of the territory. This tract, which is one of the most desolate and least known portions of the United States, is known as Papagoria from the Indian tribe which inhabits it, and it is believed that the expedition will have a rich field of work. The Papagos are said to be the most primitive people on the Western continent.

### THE POMPEY STONE.

A stone was found in a field in Pompey, N. Y., in 1820, bearing the date of 1520, with some letters, a tree encircled by a serpent, etc., and has always been an unquestioned relic of early days. It has been for seventy years in Albany, N. Y., most of the time in the possession of the State, and has often been described in historical and scientific works. The true story has just appeared.

At the centennial celebration of Onondago County in June, 1894, this interesting relic was brought to Syracuse and placed in a glass case for exhibition. Happening to be there I was asked to examine it closely and give my opinion. The various tool marks were visible; the characters were all modern, and there could be but one conclusion. A few days later a gentleman confirmed my statement, saying that it was made by his uncle and another boy in a blacksmith shop, and probably with just such tools as I described.

W. M. BEAUCHAMP.

### DONDER BEITLES.

Mr. Chas. Laubach, Riegels, Pa., under date of August 13, 1894, informs us that along the Delaware River, the American-born descendants of the Pennsylvania Germans attach great importance to celts, banner stones, etc., as charms for warding off disease and calamities. This superstition seems to be widespread.

### EXCHANGE DEPARTMENT.

Exchange notices pertaining to Archæology, not exceeding 35 words, will be inserted free for all regular subscribers. Dealers are referred to our regular advertising rates.

Books, Indian relics and cash paid for a first class typewriter and a field camera, not less than 5 x 7. rectilinear lense. Both instruments must be in first class condition. L. V. McWhorter, Berlin, W. Va.

Bibliography of the Algonquin Languages for Bibliography of the Siouan or Iroquoian Languages. Also Reports National Museum, 1889 and 1891, for same reports 1890 and 1892. F. E. Bingham, Box 162. Jackson, O.

Stamps from all over the world to exchange for Indian relics. Send list. C. Krug, Forestville, Ohio.

Some very valuable banner stones, ceremonials, gorgets, etc., for sale cheap. Warren Cowen, Elmville, Highland County, Ohio.

Rare Indian relics from Connecticut and Rhode Island to exchange for Columbian stamps above two cents; also other desirable U. S. stamps. Mine are first-class goods and I expect the same in return. All letters answered. Lock Box 21. Stonington, Connecticut.

500 good arrow heads, knives, scrapers, spear heads, drills and fancy forms for best offer in unfinished slate and stone relics. W. K. Moorehead, Columbus. Box. 502.

## Notes on Ohio Archæology.

BY GERARD FOWKE.

A concise and complete presentation of the conclusions of the most diligent workers in the study of Ohio's Prehistoric Remains. Every phase of this much discussed matter is presented, with the substance of the arguments on both sides of every disputed question, including much that has not heretofore been in print.

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WATERLOO, IND.

6t. July

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No. 12

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## EXPLORATIONS IN THE SALADO VALLEY. ✓

THE Salado, or Salt River, is a tributary of the Gila. Its course is southwest. Its rise is in the extreme eastern part of Arizona. It was in 1887 that Mr. Frank Hamilton Cushing was appointed by Mrs. Hemenway in charge of the Hemenway Southwestern Archæological Expedition, to this valley. It had long been known that very interesting ruins were to be found in the Salado country, and it was Mrs. Hemenway's desire to have them thoroughly explored.

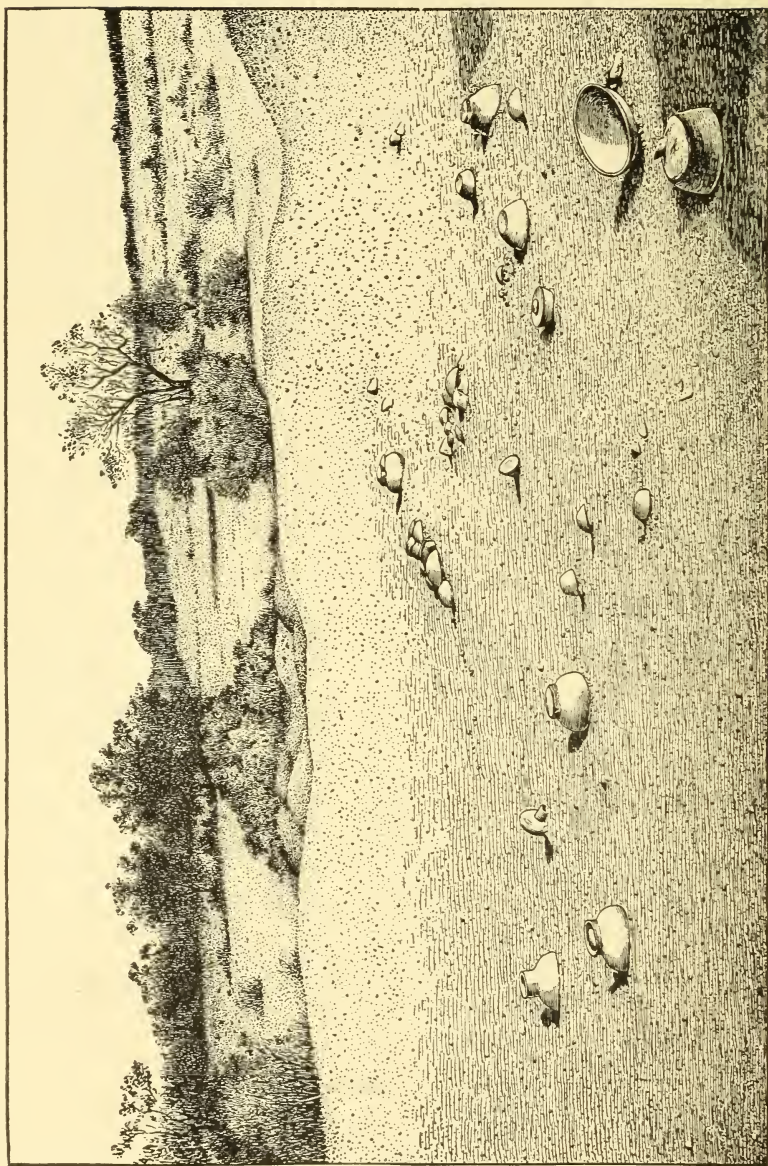
Some six months ago the Editor of THE ARCHÆOLOGIST referred to the report of the National Academy of Science upon the "Human Bones of the Hemenway Collection." He then promised the readers of this magazine, at some future time, a full report upon the results of the expedition. Through the kindness of the Secretary of the National Academy, the Public Printer and Dr. Washington Matthews, we present the following account and accompanying illustrations (which were prepared exclusively for THE ARCHÆOLOGIST). All the quotations are from Vol. VI., Seventh Memoir of the National Academy of Sciences:

"Along the great cordillera of the American Continent on both sides of the equator, through 75° of latitude, from Wyoming to Chile, extends a land abounding in ancient ruins.

"A large portion of this land of ruins lies within the boundaries of the United States. It contains the Territory of Arizona, most of Utah, more than half of New Mexico, extensive parts of the States of Colorado and Nevada, with small portions of Texas, and, perhaps, of California. Its precise boundaries are not known, for on its outskirts there is much wild and imperfectly explored country where the existence of ruins can neither be affirmed nor denied. Its approximate boundaries are: On the east, longitude 28° west (from Washington); on the west, longitude 38° west; on the north, latitude 41° north, and on the south the northern boundary of the Republic of Mexico, 31.20° to 32° N.L. It covers about 400,000 square miles.

"The great rivers which drain it into the ocean are the Colorado on the west and the Rio Grande on the east; the former flowing toward the Pacific, the latter toward the Atlantic. But much of the rain which falls on the surface does not reach the ocean; some is received in salty lakes which have no outlets; some goes to form





Pyral Cemetery, unearthed.



streams which reach the great rivers only in seasons of abundant rain, but which at other times after a brief course are absorbed by desert sands. It is an arid region, but not an absolute desert such as Gobi and Sahara. There is no part of it where rain does not fall some time during every year; but it is on the high mountains only that it descends abundantly; on the lower levels the precipitation of moisture is scanty, the dry seasons are long, and irrigation is essential to success in agriculture.

"It has long been known that there were ruins in this arid region of the southwest. The earliest travelers, beginning with the Spanish conquerors of A. D. 1540, make mention of them, and their existence is noted in the reports of various military expeditions and public surveys which have entered this region since it was acquired by the United States from Mexico in 1848. The ruins have been known to the world for three centuries and a half; they have been in the possession of the United States for over forty years, yet it is only within the past four years (since April, 1887,) that any attempt at systematic excavation has been made among them. In many of the better preserved ruins those portions which remained above the ground had been sketched, lithographed, photographed, engraved, surveyed, measured, modeled, and described, but the surface of the ground around and within them had not been broken. This method of examining them remained for the Hemenway Expedition to initiate.

"The reasons for this tardiness on the part of our archæologists are numerous. This land of ruins was until recently wild, barren, and difficult of access; it was held largely by tribes of hostile Indians who to this day are not perfectly subdued. It is only within the last decade that it has been crossed by railroads. Explorations within its borders were attended with many physical difficulties. The parties of topographical surveyors who entered the country had very short seasons in which to work, and they had neither the time nor means, had they had the inclination, to make the needed excavations. But besides physical hindrances there were others equally potent. The importance of excavation to the proper understanding of the archæology of this region was not appreciated; surface finds were numerous and interesting, and it was thought that excavation could yield nothing further. The majority of antiquarians in America were more deeply interested, as they still are, in the exploration of the old world than in that of the new. Money which was readily forthcoming for the one was withheld from the other by patrons of science in America.

"The few explorers who were interested in work within our own borders found sufficient field for their labors and speculations in the mounds and kitchen-middens of the Eastern States. It was at length, through the unsatisfied curiosity of the ethnographer, not through the zeal of the archæologist, that the systematic exploration of the Western ruins was begun.

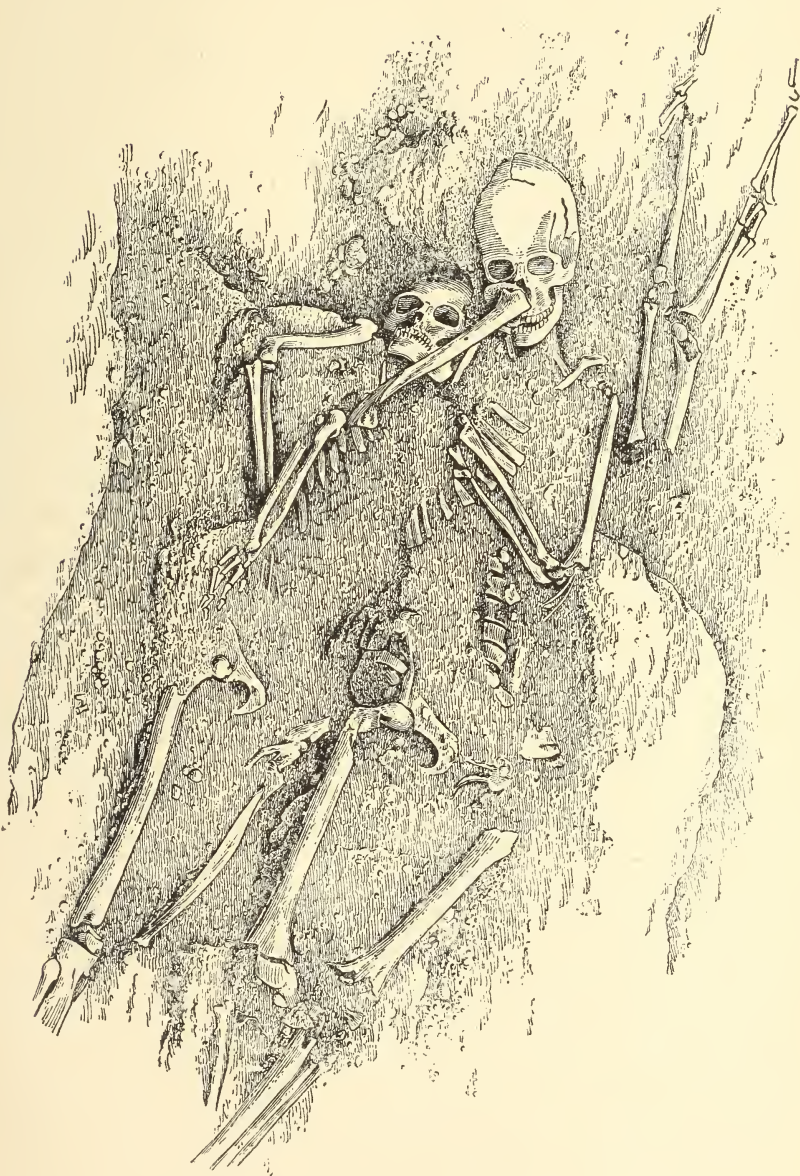
"The region in question abounds in finely stratified sandstone, which with little labor may be prepared for building, and most of

the ruins so far discovered are the remains of houses built of such stones. These may be found in all stages of decay—in some cases the walls are still standing many stories high, as in the valley of the Chaco; in other cases the sites are marked only by low heaps of lichen-covered stones, indistinguishable, save to the trained scientific eye, from natural accumulations of rocky *débris* with which the country abounds. Some of these ruins were inhabited by Indians within the brief historic period of New Mexico and Arizona, which extends over less than four centuries, but the vast majority are prehistoric. A number of the ruins are those of houses whose walls were of clay (*adobe* and a variety of *pisé*). Some of these in the valley of the Rio Grande were built since the Spanish occupation of the country, and many have been erected under civilized guidance, but others, particularly those in the valley of the Colorado, are undoubtedly of prehistoric and aboriginal origin. As might be expected the earthen walls are in many cases reduced to the common level of the ground, and are to be traced only, as in the ruined cities of the Salado, by digging beneath the surface of the earth; yet one of the best preserved and most imposing of the prehistoric ruins within our borders, the Casa Grande of the Gila is built of clay. This ruin was long supposed to be the remains of a structure without counterpart within the boundaries of the United States; but, as will hereafter be shown, it is now known to be but one of many such buildings which once towered over the wide flood-plains of the Gila and its tributaries.

"In studying the folklore and religious practices of the people of Zuñi during his residence of about five years in their pueblo, Mr. Cushing found himself confronted by many perplexing questions for which no satisfactory explanation could then be found; but he was led to believe from the traditions of this people that some key to the problems might be discovered by exploring ruins far to the southwest of the Zuñi villages, where the people of Zuñi averred their ancestors once dwelled. We can not enter into a detailed account of these perplexing questions, nor can we relate how or why the explorer considers that he has solved them. It must be left for him to explain these matters fully at some future time.

"This mound seemed at first to be little more than a rude pile of earth. It had an irregular rectangular form, and had some appearance of being terraced. The surrounding level plain, covered with an abundant growth of that leguminous shrub or small tree, the mesquite (*Prosopis juliflora*, D. C.), which is so common in the arid lands along our southwestern borders, presented to the untrained eye no remains of human habitation; but from fragments of pottery and other objects strewn over the ground, the explorer was led to believe that something of importance was hidden under the surface. He caused a trench to be dug and soon brought to light the foundations of earthen walls. Without delay he established his camp at this place and pursued his excavations with energy. The result was the discovery of an extensive collection of habitations—a city it might be called—some 6 miles in length and from half a mile to a mile in width.

Double Burial; perhaps of man and wife.





The mound proved to be the *débris* of a great earthen house of many stories and many chambers, and analogous in structure to the still standing Casa Grande before referred to, which is distant from the mound to the southeast less than 35 miles in a direct line. In the course of excavation at this place so many skeletons were found under the floors of the houses that Mr. Cushing devised for it the Spanish name of Pueblo de los Muertos, or, briefly, Los Muertos, the town of the dead; and this name was retained for it, although he subsequently found other ruined cities in the vicinity where skeletons were as common as here.

"Work was continued in the valley of the Salado or Salt River until June, 1888, a period of about sixteen months. During this time, besides isolated ruins and small groups of ruins, the party discovered the remains of six other large cities, within a distance of about 10 miles from that first discovered. Of these, three were named: First, Las Acequias from the number, size, and distinct appearance in its vicinity of the old acequias or irrigating ditches through which the departed inhabitants conducted water to their fields; second, Los Hornos or The Ovens, from the number of earthen ovens found there, and third, Los Guanacos, because in it were found small terra-cotta images of animals thought to resemble the guanaco of South America. In these ruined cities the remains of other buildings like the Casa Grande were found."

#### HOUSES.

"The houses in these cities were of four kinds, designated by Mr. Cushing as follows: 1, priest temples; (2), sun temples; (3), communal dwellings and (4) ultra-mural houses.

"*The Priest Temples.*—These were the most conspicuous buildings in the ancient cities. As a rule, there was only one to each city, and this was centrally located; but in one of the cities observed there were seven such buildings, the largest of which was centrally located. The reasons for this peculiar distribution, Mr. Cushing believes, are explained by the Zuñi folklore and modern Zuñi customs. The ruins gave evidence that the buildings, when standing, were many stories high—from four to seven stories it is estimated. The Casa Grande on the Gila is said to show traces of five floors in that portion of its walls which still remain, and it is probable that one or two stories have fallen. Each building was surrounded by a high rectangular wall from five to ten feet thick. A portion of this wall remains, and, being filled with the *débris* of the fallen building within, lends to the mound-like ruin that terraced appearance before alluded to. The lower story in each building was divided into six apartments, four great and two lesser. These apartments, the explorer believes, were used as store rooms for the priestly tithes in maize, etc. The other stories are supposed to have been used for priestly residences and for sacerdotal purposes. The entire building is thought to have served, not only as a storehouse and temple, but as a fortress in times of danger. Besides these in Arizona, there are great houses of similar construction in Sonora and Chihuahua, in northern Mexico.

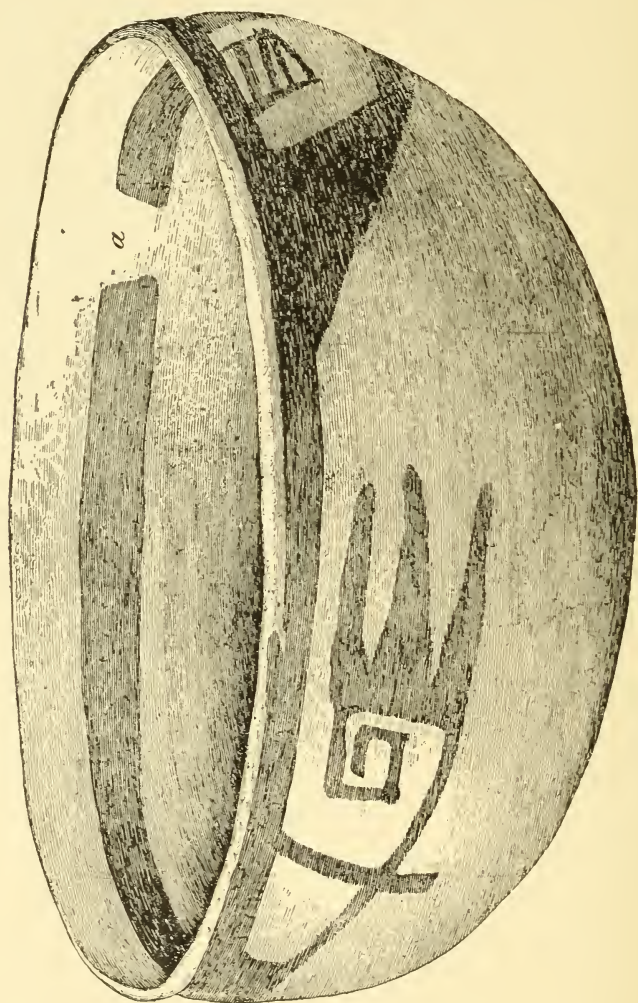


"The manner in which these buildings were constructed is perhaps peculiar. They might be regarded as great mud-covered baskets. For the thicker walls two rows of posts were erected and secured, one post to another, in different directions, by means of smaller sticks firmly lashed to them. The framework thus constructed was wattled with reeds, so as to form two upright hurdles braced together. The space between these was filled with well-packed mud, and the hurdles were thickly plastered within and without with the same substance. The thickness of the wall depended on the distance between the hurdles. For the thinnest walls, the internal partitions, but one hurdle was erected, and this was plastered on both sides. These structures of wood and reed no longer remained when the excavations were made, but the cavities found in the walls gave evidence of their former existence.

"*Sun Temples.*—The buildings which Mr. Cushing designates by this name, though not as lofty as the priest temples, covered a greater superficial area. The smallest measured was 50 feet in width by nearly 100 feet in length. One was discovered whose dimensions were about 150 feet in width by over 200 feet in length. Like the priest temples they were built of earth on a great basket form or frame of hurdles; but the basket form, instead of being rectangular, was elliptical in shape. There is evidence that this frame of hurdles gradually tapered toward the top, and that the structure was roofed in with a dome made of a spirally contracting coil of reeds, resembling the coil baskets now so commonly made by the various tribes of the southwest. The spiral coil, as well as the rest of the frame, was heavily covered outside with mud, so that the structure when finished must have appeared, as Mr. Cushing expresses it, like an unburned, inverted and elongated terra-cotta bowl. The floor was elevated at its edges so as to form a sort of amphitheater and in the center was a hearth. It is thought that in these buildings the public rites of esoteric societies were performed as well as the sun drama and other ceremonies. The sun temples were usually in close proximity to the priest temples, and their ruins presented the appearance of low oval mounds depressed in the center.

"*Communal Houses.*—The great structures thus designated were the principal dwelling places. They were built of mud without the central frame of hurdles on which the walls of the temples were raised. They contained many rooms on the ground floor, and, as there is evidence that they were sometimes more than one story high, it is not improbable that they resembled much the modern terraced pueblos of New Mexico and Arizona. They were too large for the dwellings of single families, and for this and other reasons they are thought to have been each the home of a separate gens, clan, or some other large subtribal division. Each was surrounded by a separate high earthen wall, and generally by a separate canal or acequia, although, in a few instances, two or more communal dwellings were included in the same encircling canal. Each had its single appropriate water reservoir with a branch canal leading into it, its one separate pyral mound or place of cremation, and its one great underground oven

for the preparation of food. In Los Muertos at least fifty of these great buildings were wholly or partially unearthed, and it is likely that many more remained unrevealed beneath the surface of the ground.



Ancient Cibola Eating Bowl, showing "exit trail of life."

"*Ultra-mural Houses*.—These were small, low huts, not rectangular in form, made of sticks, reeds, and similar perishable material, lightly coated with mud, and they probably resembled much the modern *jakal* or hut of the lower classes in many parts of Mexico, or the houses of the present Pima Indians of the Gila Valley. Mr. Cushing calls them ultra-mural or ultra-urban because they were situated outside the limits of the towns of earthen houses and not mingled with them; they formed separate groups. He conjectures

that they may have been residences of an outcast population such as exists at Zuñi today. As each contained a central fire-place it is evident that they were occupied in winter as well as in summer, and were, therefore, not like certain houses scattered through the fields of the modern Zuñis, used only as temporary shelter for laborers while the crops are growing. These ultra-mural dwellings were very numerous; in one place constituting, of themselves, a town of considerable size, which contained a sun temple but no priest temple. In estimating the age and character of some, at least, of these houses, it must not be forgotten that as late as the seventeenth and eighteenth centuries we have records of the existence of Pima villages in the lower part of the Salt River Valley. I make this statement on the authority of Mr. Bandelier."

The explorers estimated the number of miles of large irrigation canals at 150. The extent in miles of the smaller acequias could not be estimated. "The larger canals vary in width from ten to thirty feet, and in depth from three to twelve feet. Their banks were terraced in such form as to secure always a uniform central current in the canal when the rains ceased in the mountains and the waters diminished. It is thought that this device was to facilitate navigation, and that the canals were used not only for irrigation, but for the transportation of the produce of the fields and of the great timbers from the mountains, which the people must have needed in the construction of their tall temples and other houses." The expedition found canals twelve and fifteen miles from the present site of the river, and yet there is no evidence that the stream has changed its channel. Ranchers of the region have used many of the ditches as wagon roads, and others, especially the Mormons, have cleaned them out and used them to carry water to modern fields. One Mormon told Mr. Cushing that his people had saved \$20,000 in one small section of the country by the use of these ancient canals.

#### BURIALS.

"The bodies of the dead were buried both with and without previous cremation. Those buried without cremation were always buried in the houses, either under the ground floors or in the walls. The cremated remains were interred outside of the houses.

"The wall or mural burials were found mostly in the priest temples, in what remained of the first and second stories; a few were discovered in the communal dwellings. The body in such a burial was inclosed in an adobe case, and a niche was cut in the wall for its reception, which was afterwards filled and plastered over with mud, so as to leave no external evidence of the burial.

"The burials under the floors were confined to the communal dwellings. The graves were constructed with different degrees of care; the more perfect being rectangular holes carefully plastered on the sides with mud and sealed over with the same material. The dead were usually placed with their heads to the east and slightly raised or pillowed so that the faces were turned toward the west. The hands were laid at the sides or over the breast. The lower



extremities were placed as we place those of our dead, except in one instance, that of an adolescent female who was supposed to have been sacrificed to the gods to avert earthquake. She was buried with the limbs abducted.

"In a few instances, in the communal dwellings, the body was buried partly under the floor and partly in the wall. This was supposed to be for the purpose of economizing space. The trunk, in a supine position, was buried close to the wall; the lower limbs, elevated at right angles to the trunk, were placed in a niche in the wall which was then filled up with mud.

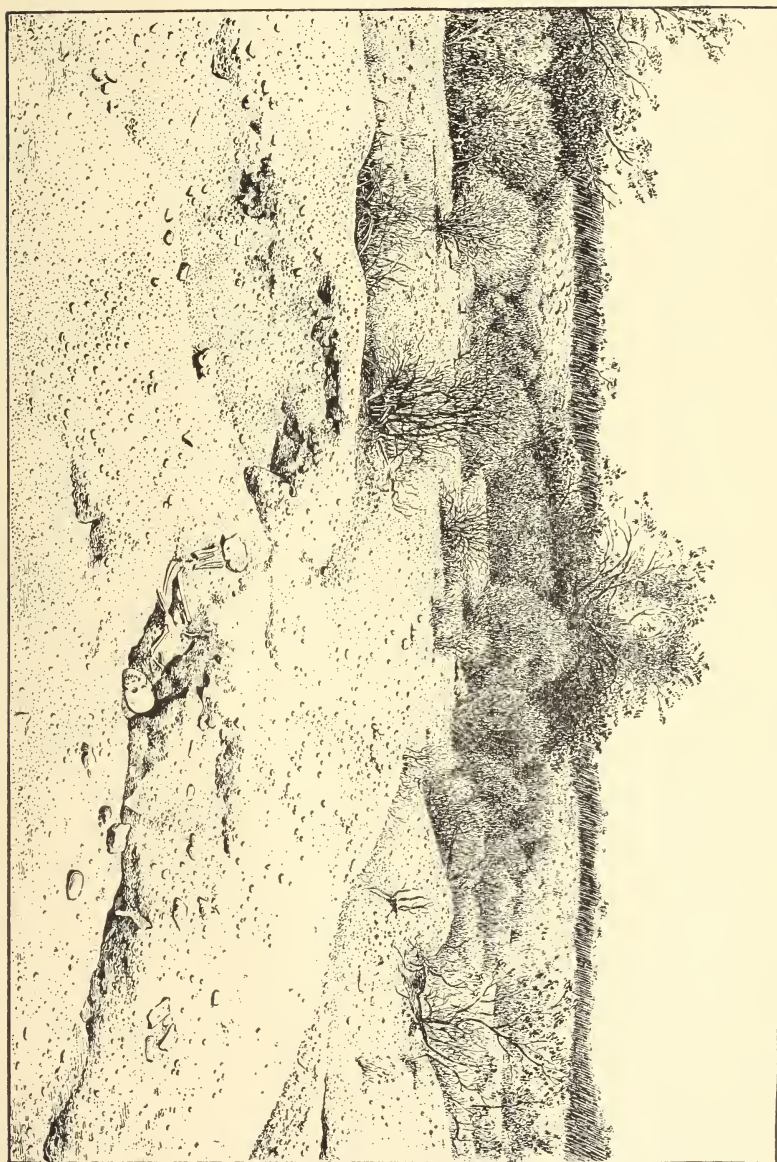
"Among those buried under the floors many were children, and these were found always buried near the kitchen hearths. This is a custom which is found to have prevailed in other parts of the world, and is variously accounted for. Mr. Cushing's explanation derived from Zuñi folklore and belief is this: 'The matriarchal grandmother or matron of the household deities is the fire. It is considered the guardian, as it is also, being used for cooking, the principal 'source of life' of the family. The little children, being considered unable to care for themselves, were placed, literally, under the protection of the family fire, that their soul-life might be nourished, sustained and increased.'

"Within both the underground and wall sepulchers were found deposited various household utensils, articles of personal adornment and others of a sacerdotal character. In the mural burials of the temples the articles of sacerdotal use were particularly numerous and elaborate. This is one of the many reasons Mr. Cushing has for believing that those buried without cremation were of a sacerdotal and higher class of the community, while those who were cremated were of a lower class, and laymen. The pottery buried with the adults in the graves was left whole, and not broken or 'killed' in the manner to be described when speaking of burials after cremation; that buried in graves with children was, however, usually 'killed' or broken. The sacred paraphernalia referred to were so similar to those used in Zuñi to-day that Mr. Cushing 'was often able, through the knowledge of the Zuñi priesthoods, to identify the medicine or priestly rank of the silent occupant of a sepulcher.'

"The great majority of the dead were cremated. Each communal dwelling had in close proximity to it, its own pyral mound and, situated at the base of the latter, a collection of earthen vessels containing the remains of the dead — a pyral cemetery. The mounds consisted of ashes, cinders, and fragments of charred and broken mortuary sacrifices; they were from 60 to 100 feet in diameter, from three to nine feet high, and showed evidence of having had from two to six locations for pyres in each. That each pyral mound was appropriate to its neighboring communal house was inferred from the correspondence of certain special marks and designs on the pottery in the pyral cemetery with designs found on pottery in the graves of the contiguous dwellings."

"Double burials were found both with the cremated and the uncremated remains; but were much more common with the latter





Skeleton of Man, supposed to have been killed by earthquake.

than with the former. When two skeletons were discovered in one grave or incinerary vessel they were invariably adult, and, whenever the sex could be determined, one was always found to be a male and the other a female—presumably man and wife. This might be thought to indicate that the wife had been sacrificed at the death of the husband; but in the house-graves there was often evidence that the interments were not simultaneous, the upper grave not being dug exactly over the lower and the bodies having been apparently wrapped in different cerements. It was a rare thing to find three buried in one grave. The illustration shows a double burial, male and female, in which the interments, and probably the deaths, were simultaneous."

They found no copper, save a few small trinkets; no other metal. Pottery occurred in great numbers and in all forms. There were food, water and ceremonial vessels. Some of the specimens were well executed images of animals, birds and human beings. One of the decorations is worthy of especial notice. "It is what the *Zuñis* call the exit trail of life. It is found inside of food vessels and outside of water vessels; it consists of an opening or hiatus in the single or double encircling paint bands near the margin of the vessel. It is based on the idea \* \* of vessels having souls." The accompanying illustration shows this peculiar mark at *a*.

"During the first fifteen months of the work of the expedition from 17,000 to 20,000 specimens of various kinds were collected, and many fragments rejected. But the collection would have been far richer were it not for the wanton destruction of much material by visitors. Sometimes when a pyral cemetery or the floor of a large dwelling had been unearthed, and all the articles discovered laid in their original positions to be photographed, a party of sight-seers would appear and, either in the absence of the workmen, or in spite of their remonstrances when present, trample the objects under foot or deliberately kick the pottery to pieces to 'see what was inside.' In the earlier days of the work many fine skeletons were lost in this way. Some persons even appropriated handsome objects and carried them away, maintaining that, as these things were found on public land, all had an equal right to them."

#### POPULATION.

"What was the population which in ancient days subsisted on the crops watered by the Salado or Salt River, and the stored rains of the neighboring mountains? What was the population of the old Salado settlement? Opinion is divided on this subject, and will probably long continue to be divided. Some who have had the best opportunities of observing the ancient works and studying the problem, estimate the population at from 80,000 to 100,000 souls. *Los Muertos*, it is calculated, covered an area of over two square miles, and contained about 13,000 inhabitants. There were six other groups of buildings in the region as large or larger than this, and there are indications that they were simultaneously occupied. If it could be shown that they were not occupied at the same time, a much

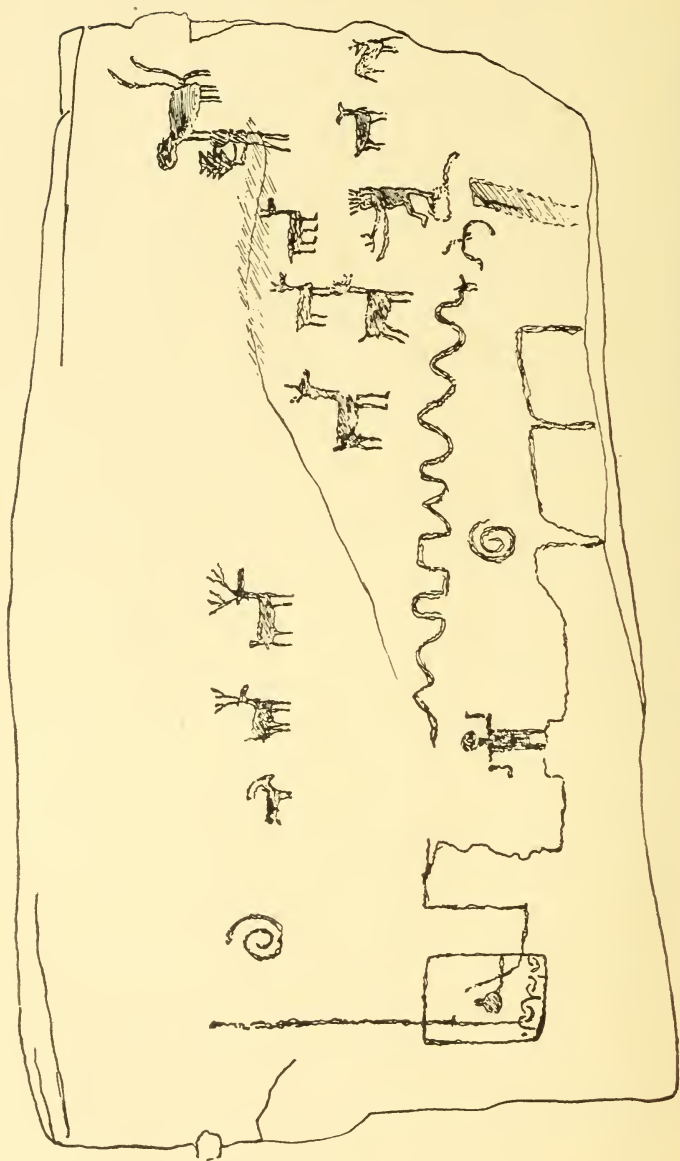
lower estimate of the population would have to be made. As the land is now becoming rapidly filled with white settlers, and the ancient town sites are being covered with farms and crossed with irrigating ditches, all antiquarian problems become more difficult of solution every day."

#### ANTIQUITY.

"In 1539, when Friar Marcos made his journey to Zuñi, and when, a year later, Coronado marched with an army to the same point, they passed within about 100 miles of these towns. Had they been inhabited in those days, the travelers would doubtless have heard of them, for the fame of the less significant Seven Cities of Cibola reached them in the heart of Mexico, and induced them to travel 200 miles further northeast than the mouth of the Salado. They were ruins, no doubt, 350 years ago, or at the beginning of the historic period of Arizona. No vestige of anything belonging to the iron age or of European origin was brought to light in the excavation. The writer knows of other ruins in New Mexico and Arizona which, from recorded evidence, are known to have fallen to decay and been abandoned long before the historic period; yet in these textile fabrics and other perishable articles are still found fairly preserved, and particularly the hair of the dead has survived the process of decay. In Los Muertos were found no hair, no cerements, nothing that might have escaped destruction in a thousand years. It is thought by Mr. Cushing that from one to two thousand years may easily have elapsed since the priests of Los Muertos worshipped in its standing temples. The Casa Grande of the Gila was a ruin standing in the sixteenth century, probably, much as it stands to-day; three and a half centuries have wrought little change in it; but the similar priest-temples of the neighboring Salt River are mere mounds of earth. The writer has seen two photographs of the Casa Grande of the Gila taken from the same point of view, one twenty years after the other, yet in the pictures no difference can be discerned in the most minute points and prominences of the ruin, which were subject only to the modifying influences of rain and wind, though the parts within the easy reach of human hands have suffered notably.

"It must be remembered that earthquake may have hastened the fall of the Salado temples. The explorers have found many indications that these cities were abandoned on account of earthquake, and Zuñi myth and tradition point to former migrations of the people induced by seismic disturbances. One skeleton in Los Muertos was found lying on its face, evidently of a person never formally buried, and apparently crushed by falling walls.

"It has been indicated in the previous pages that an intimate relationship in arts, civilization, religion, etc., has been found to exist between the ancient Saladoans and the ancient sedentary people of Arizona and New Mexico in general, as well as the still extant sedentary tribes of this region. A relationship, less intimate perhaps, may be shown to exist between them and the ancient house-



Rock Inscription, representing, it is supposed, vicuña-like animals and bola-thrower, besides deer and other animals.



building tribes of old Mexico and Central America. There are many facts, too, which point to a close connection between the Saladoans and ancient Peruvians—a connection more close perhaps than that between the former and many races who lived nearer to them, geographically, than the Peruvians. Environment may have had its influence on this affinity, for the conditions surrounding human life in Peru are more like those of Arizona than those of tropical Mexico and Central America.”

In the cut of a rock inscription herewith presented, there will be seen several vicuña-like animals. The writers seem to be in doubt as to the presence of a wool-bearing creature among the ancient people of the Colorado Valley. The recent explorations in the San Juan country have settled this question. We can now accept the figures of the vicuña found by the Hemenway Southwestern Archaeological Expedition as further evidence of the general domestication of that animal.

“It has been surmised that such animals continued to be domesticated by the sedentary Indians of Arizona and New Mexico down to historic days, and became extinct only when the more serviceable European sheep was introduced by the Spaniards. This surmise is based on certain statements found in the works of early writers and explorers who speak of the Pueblo Indians having a coarse cloth, something like woolen cloth, and having small wool-bearing animals domesticated in their houses. But Prof. Bandelier, who has studied the early documentary evidence relating to the Southwest more thoroughly, no doubt, than any other living student, discredits the modern existence of these animals. In a letter to the writer, he shows that we have only hearsay testimony as to their existence, and concludes with these words: ‘If there has ever been a llama, guanaco, or vicuña, known to the Southwestern Indians, it became extinct long previous to the sixteenth century.’ Fossil bones of an animal of this family have been found in the Southwest; but its bones were not identified in the Salado ruins.

“In several places among the ruins, on the floors of the houses, near the walls (as if they had fallen from the latter), were seen peculiar groups of stones, consisting of three globoid and one ovoid pebble. These are thought to have been the stones of *bolas* such as are now used in South America to catch wild or half domesticated animals. The buckskin cases and thongs which connected the stones are supposed to have decayed, like all similar material in the ruins. The presence of these stones would, in itself, be insufficient evidence of the use of *bolas* among this people, but it is thought that petrographs afford additional testimony. Where these vicuña-like animals are delineated on the ancient rock carvings, they are often associated with the figure of a man holding in his hand a peculiar four-branched instrument; one of the branches is held by its extremity in the hand, the others are in the air. This is thought to depict a herdsman or hunter in the act of casting the *bolas*. The *bolas* have, as far as can be ascertained, not been in use in North America

south of the Arctic circle since the Columbian discovery, although an implement, analogous in use but different in form, is employed by the Eskimo."

The bulk of the work is devoted to the skeletons of the Salado Valley. We have spoken at some length in a former review of them, so further mention here is not necessary. The work taken with that of Baron Nordenskiöld, Professor Montgomery and several others, solves most of the archæologic problems of the Southwest.

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## AN INSPECTION OF MODERN INDIAN VILLAGE SITES IN OHIO.

WARREN K. MOOREHEAD.

Read before the Brooklyn Meeting of the American Association, August, 1894.

IT is generally understood that the difference between the prehistoric and the historic Indian village site is very marked. It has been frequently asserted that the relics of man found upon the historic sites are largely of European manufacture. With a view of determining the proportion of objects of native make to those made by the whites, I made a careful inspection of five of the largest Shawanese village sites in southern Ohio. The locations were, Old Town, three miles north of Xenia in Greene County (called Upper Chillicothe), Frankfort, Ross County (called Lower Chillicothe); Cornstalk Town on Sipo Creek, six miles west of Circleville, in Pickaway County; Squaw Town (where Logan lived, and where he made his famous speech), one mile up Sipo Creek from Cornstalk Town; Westfall, three miles west of Circleville, upon the banks of the Scioto River.

In company with several persons familiar with all sorts of village site material, I went over the entire space occupied by each town. The results of the observations were somewhat of a surprise. Less than fifty glass beads, bullets, tomahawks, knife blades, buttons, bricks, modern crockery, gun flints, earrings, etc., were found. The small number of such relics cannot be accounted for upon the grounds that the surface searching was hastily done, or that the ground was not properly traversed. On the other hand, pottery of the same character as that called prehistoric, stone celts, pestles, axes, arrow heads and flint chips, hammers and rubbing stones, broken ornaments, etc., were found in numbers exceeding three hundred.

At various times between the years 1700 and 1780 the French and English had trading stores in these towns. Reference to any of the narratives of Indian wars, personal accounts of captivity, etc., will give one an idea of the length of stay of the traders, the amount of goods distributed, the number of Indians in each village, etc.

Taking Cornstalk town by way of example, the amount of goods distributed by the English in one year amounted to more than \$50,000. That town contained (1730 to 1780) more than one thousand persons, and the population was constantly ranging above or below that number as war parties left and councils, assemblies, etc., called in surrounding tribes. It is not necessary for me to enlarge upon the vast number of iron, copper, silver and lead objects which must have been lost, traded, carried away or buried. It is only important that I should call attention to the singular fact that so few modern implements should be found upon town sites where a population is known to have existed for more than seventy-five years.

The prehistoric sites furnish pottery, stone, bone and shell relics very like those found upon the modern sites. We must, therefore, conclude that the great quantities of such material found upon historic sites indicate that the introduction of more serviceable utensils, weapons and ornaments did not displace the old and more primitive forms, but that both were in common use; or, that the ancient forms and the rough pottery sherds and rude stone relics marked the site of towns which existed before the advent of the traders; or, lastly, that the use of native material was not abandoned for the newer utensils. In any event, we must accept the proposition that nearly all of the relics left by the traders have either disappeared or resolved themselves into dust as a consequence of the action of the elements, or were so well cared for as to be taken away by the tribe on their removal from the locality. The finding of a occasionally rusty knife blade, pieces of iron and gun locks would indicate that the latter proposition is not well taken.

The important point to me in the examination is that we can assign to all large village sites a considerable period of occupancy. If the traders after a residence of seventy-five years among the Ohio tribes upon the sites named, have left so few relics of their intercourse that less than fifty can be found in ten day's search over the fields, must we not assign several generations of occupancy to a site where the same party (which examined the modern villages) found upwards of five hundred prehistoric relics? It seems to me that this field worked gives a rule or scheme of comparison. It cannot be affirmed that few Indians inhabited the modern sites and many lived on the prehistoric. Old Chillicothe contained one thousand souls for more than fifty years. I cannot conceive that it is unreasonable, or that it marks a departure from the fact when I state that the prehistoric sites contained many thousand more objects than the modern, and that, with the evidence in hand, they must have been populated for a much longer period or by larger numbers.



## THE STUDY OF ANTHROPOLOGY IN AMERICAN COLLEGES.

GEO. A. DORSEY, PEABODY MUSEUM.

THE subject of this paper was suggested to me by a pamphlet entitled *Graduate Courses* which has recently been compiled by a committee of the Graduate Club of Harvard University. Section 13 of that pamphlet is devoted to Social Science, Anthropology and Ethnology, and gives in tabulated form all the courses on their subjects which are offered by nineteen of our leading colleges. From this list I have endeavored to eliminate all courses devoted to pure economics while those which may be said to fall within the field of Anthropology, using that word in its broadest sense, have been retained.

I am also indebted to the admirable little paper of Dr. Brinton, entitled "Anthropology as a Science and as a Branch of University Education" (Phila., 1892).

As the *Graduate Courses* include only nineteen colleges, it will be impossible to make this paper as complete as would be desirable. There are undoubtedly several other colleges where instruction in Anthropology is given, but having no data at hand I am unable to mention them. I can supply the omission, however, in a few instances from my own knowledge. The colleges will be considered in their alphabetical order. The courses as announced are for the year 1894-'95.

Following the brief title of the courses are given the number of hours per week and number of weeks of appointment with instructor. Unless the months are given, the courses usually extend from October to May (inclusive).

- L    Number of hours laboratory work.
- Course open also to undergraduates.
- lab. Laboratory work (indefinite).
- fort. Fortnightly.

The names of the months have been abbreviated as follows: Ja., F., Mr., A., My., Ju., Jul., Au., S., O., N., D.

### BROWN.

#### Alpheus S. Packard,

M.D., Ph.D.; Prof. of Zoology and Geology—Libr. Boston Soc. Nat. Hist., '65; State Entomologist, Mass., '71-'73; Lecturer, Mass. Agr. Coll., '69-'77; Maine Agr. Coll., '71; Bowdoin, '73-'76; w. U. S. Geol. Surv., '75-'77; w. U. S. Fish Com., '71-'74'.—Many scientific works, chiefly Zoology and Geology.

Anthropology. 3, 13, A.-Ju.



## BRYN MAWR.

(Instructor not announced.)

Sociology, 1, 30.

Seminary in Sociology.

## CHICAGO.

## Albion W. Small,

Ph.D., Johns Hopkins, 1889; Head Prof. Sociology, and Dir. of the Affiliated Work.—Newton Theol. Inst., '76-'79; Berlin, '79-'80; Leipzig, '80-'81; Johns Hopkins, '88-'89; Colby Univ., Prof. History and Pol. Econ., '81-'88; President, '89-'92.

Methodology and Bibliog. of Soc. Sciences. 4, 6, Jul.-Au.

Province of Sociol. and its relat. to Special Soc. Sciences. 4, 12, O.-D.

Province of Sociol. and its relat. to Special Soc. Sciences. 8, 6, Jul.-Au.

Social Anatomy, Physiology and Psychology. 4, 24, Ja.-Ju.

## Charles R. Henderson,

A.M., B.D., Bapt. Union Theolog. Sem.; Asso. Prof. of Sociology and Chaplain of the Univ.—Pastor, Terre Haute, '73-'82; Detroit, '82-'92.—Papers on labor questions, charities, reforms, dependents, defectives and delinquents.

Social Organiz. for Prom. Soc. Welfare (sem.) 2, 36, O.-Ju.

Soc. Instituts. of Organiz. Christianity. 4, 6, N.-D.

Social Treatment of Crime and Criminals. 4 or 8, 6, A.-My.

The Family. 4, 6, O.-N.

## Frederick Starr,

Ph.D., Lafayette Coll., 1885; Asst. Prof. Anthropology and Curator of Museum.—Prof. Biol. Sci., Coe Coll., '84-'88; in charge of Dept. Ethnol., Am. Mus. Nat. Hist., '89-'91.

Lab. Work in Anthropol. 4, 36, O.-Ju.

Physical Anthropol. (lab.) 4, 36, O.-Ju.

General Anthropology. 4, 12, O.-D.

Ethnology. 8, 12, Ja.-Mr.

Prehistoric Archæology. 4, 12, A.-Ju.

## Gerald M. West,

Ph.D.; Docent in Anthropology.

Applied Anthropol. L. 10, 36, O.-Ju.

## W. I. Thomas,

Ph.D., Fellow in Sociology.

The Historical Sociologies. 4, 12, Ja.-Mr.

## CLARK.

## A. F. Chamberlain,

Ph.D., Clark, 1892; Lecturer in Anthropological Psychology, Toronto, '87-'90; Clark, '90-'92; American Anthropology, Ethnology, Linguistics and Folk-Lore; Canadian-French, and American Dialects; Low German Languages and Literature; Linguistic Psychology.

General Anthropology, including Hist., Phys. Anthropol., Ethnogr., Ethnol., Linguistics, Criminal and Patholog., Histor. and Archæol. Anthropol.

Anthropology and Ethnology of Sex. History and Sociology of Woman. Woman in Art, Religion, Language, Civilization, etc.

The Child amongst Primitive Peoples.  
 Comparative Mythology of America and the Old World.  
 Psychology of Primitive Languages.  
 Comparative Literature. The beginnings of Art in Languages.  
 The Æsthetical Ideas of Primitive Peoples.  
 Relations of Anthropology to Psychology and Pedagogy.

## COLUMBIA.

**R. Mayo-Smith,**

Ph.D., hon., Amherst; Prof. Political Econ. and Social Science—Berlin, '75-'77; Heidelberg, '78; Mem. Nat. Acad. Sci.; Hon. Fell. Roy. Statis. Soc., etc.; Joint Ed. Polit. Sci. Quart.—Statistics and Econom., Bureau of Labor; Census of U. S. and Census Methods; Wage Statistics; Emigration and Immigration; Internal Revenue; Methods in P. E.

**Franklin H. Giddings,**

A.M., Union Coll.; Prof. Political Science; Ed. Monographs of Am. Econom. Ass.; V. P. Am. Acad. Polit. and Social Sci., and Assoc. Ed. of Vol. 1. of its Annals.—Profit Sharing, Distribution, Theory of Capital and Interest, Theory of Sociology.

Sociology. 2, 16, O.-Ja.

Crime and Penology. 2, 14, F., My.

Evolution of Family. 2, F.-My.

**L. Farrand,**

A.M., M.D.

Anthropology, 2, 30.

**W. Z. Ripley,**

Ph.D.; Prize Lect., '93-'96, on Phys., Geog. and Anthropol.

Phys. Geog., Anthropol. and Ethnol. 2, 30.

## HARVARD.

Peabody Mus. Am. Archæol. and Ethnol., with its library, is intended for research. \*1-Fellowship of \$500 in Archæology; 2 prizes of \$100 each for essays on Social Questions.

**F. W. Putnam,**

A.M.; Peabody; Prof. Am. Archæology and Ethnol.; Curator Peabody Mus.—Chief of Dept. Ethnology, Archæology and Hist. at World's Columb. Expos.

Course in Spec. Training in Archæol. and Ethnol. during 3 yrs.; Lects., Field Work, Explorat., Ability to use French and Spanish necessary.

(With G. A. Dorsey, Ph.D., Harvard, 1894.)

General Anthropology, with special reference to American Archæology and Ethnology. Lectures and Laboratory Work. I and Lab. 31.

## LELAND STANFORD, JR.

**Amos G. Warner,**

Ph.D., Prof. of Econ. and Social Science.—Johns Hopkins, 1885-'87; Sec. Charity Org. So., Baltimore, 1887-'89; Asso. Prof., Univ. of Nebr., 1889-'91; Supt. of Charities, D.C., 1891-'93.—Co-op.; Statistical determ. of Causes of Pov.; var. Articles on Charities.

Social Pathology and Charities. 2, 32.

Seminary. 2, 32.

## PENNSYLVANIA.

Museum of American Archæology and Ethnology.

**Daniel G. Brinton,**

A.M., Yale, M.D.; Sc. D.; Prof. American Archæology and Linguistics.—Yale; Paris; Heidelberg; Prof. Ethnology, Acad. Nat. Sci., Phila.—Archæology; American and General Anthropology; Comp. Religion; American Linguistics.

Courses in Archæolog. Exploration, esp. American; relat. of Archæology and Ethnology.

*Linguistics:*

General Structure of American Languages.

Traits of Principal Linguistic Stocks of North and South America.

Studies in the Grammatic Structure of Algonkian, Uto-Aztecan Maya and Kechua Stocks.

Elementary Reading in the Nahuatl Tongue.

## WESTERN RESERVE.

**C. F. Thwing,**

D.D., Chicago Theolog. Sem., '88.—Pres. West. Res. Univ. 1890

The Family as an Historical and Social Institution. S.-Ju.

**M. M. Curtis,**

Ph. D., Leipzig, '91; Prof. of Philos.—Leipzig, '88-'91.—Locke's Ethical Philos. Anthropology. 3, S.-Ja.; or

Sociology. 3, F.-Ju.

## YALE.

**W. G. Sumner,**

L.L.D., Jena, 1884; Prof. Pol. and Soc. Sci.—Money, Wages, Protectionism Soc. Classes, Elections, Biog. of Financiers.

Hist. Develop. of Mod. Indust. Organ. 2, 32.

Anthropology. 2, 32.

Social Science. 2, 32.

In addition to the courses given in the above list of colleges, Professor W. T. Sedgewick lectures on Anthropology at the Massachusetts Institute of Technology. His course is supplemented by one by Dr. J. Walter Fewkes of the Hemmenway Expedition.

There has been recently established at the Ohio State University a Museum of American Archæology. Its curator, Mr. W. K. Moorehead, announces a course of lectures on American Anthropology.

There is probably no medical school in the country that does not give instruction in some form in Physical Anthropology, yet the Medical School of the National University at Washington is unique, so far as I know, in its course on Prehistoric Anthropology. This is given by Professor Thomas Wilson of the Smithsonian Institution.

While, as may be noted above, there are a large number of colleges giving instruction in Anthropology in some form, yet it is worthy of special notice that in four of them Anthropology, and especially the subdivisions of Archæology and Ethnology occupies a prominent place. Foremost among these is Harvard. The Pea-

body Museum of American Archæology and Ethnology was founded in 1866, and was the first Museum exclusively devoted to these subjects to be established in America. Under its two curators, Professors Jeffries Wyman (1869-'74) and F. N. Putnam (1874-——) the Museum has grown very rapidly and is now the best equipped College Museum of its kind in this country.

The chair of American Archæology and Ethnology was established by Harvard in 1885 with Professor Putnam as its first occupant. Previous to that time and up to 1890 there were several assistants and students connected with the Museum at irregular intervals and for different periods of time.

In 1890, the Department of American Archæology and Ethnology was announced in the catalogue of Harvard as one in which students properly qualified might become candidates for the degree of Doctor of Philosophy, and a three years course was offered by Professor Putnam. This opportunity was made use of by two students who entered the Department in the fall of '90. In the same year, the Hemmenway Fellowship with an annual valier of \$500.00 was founded. Of the two students, one met an untimely death while engaged in research in the ruins of Copan, Honduras; the other received his Doctor's degree at the last commencement.

A still further advance was made in the study of Anthropology at Harvard, when a full course (three hours a week for the entire year) was thrown open this fall to graduates, and undergraduates who are properly qualified. At present eight students are availing themselves of this privilege.

The second centre of Anthropological study to be noted is that of the University of Pennsylvania. There, for many years, has been maintained a Museum of Anthropology, where America alone has not only been represented, but Egypt, Assyria and China as well. At the head of Anthropological instruction at the University is Dr. Daniel G. Brinton, a close student who is widely known through his extensive publications in the various branches of the science. Dr. Brinton holds the double position of Professor of American Archæology and Ethnology in the University, and of General Ethnology at the Academy of Natural Sciences of Philadelphia. In the University, he offers several courses in American Linguistics, and a course in General Archæology.

Among those connected with the Museum at the University may be mentioned, Mr. Stewart Culin, General Secretary and Director, and Curator of the section of Asia and General Ethnology; Mrs. Cornelia Stevenson, Honorary Curator of the Egyptian and Mediterranean Section, and Mr. Henry C. Mercer, Honorary Curator of the Section of American and Prehistoric Archæology.

When Clark University first opened its doors, the study of Anthropology had a prominent place. Dr. Franz Boas was Docent in this Department, and gave special attention to the study of Physical Anthropology.



On the retirement of Dr. Boas from his position at Clark in 1892, he was succeeded by one of his pupils, Dr. A. F. Chamberlain, who was appointed Lecturer in Anthropology, and is at present giving the two courses of lectures as stated above.

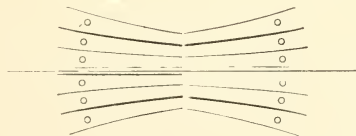
In the University of Chicago Anthropology plays a somewhat secondary part in the Department of Sociology. Dr. Frederick Starr, however, offers several courses embracing Physical Anthropology, Ethnology and Archæology.

Situated in Chicago, and very near the University is the recently established Field Columbian Museum. One of its sections is devoted to Anthropology, and as it consists of a large part of the Department of Ethnology of the Columbian Exposition, it has the nucleus of what will undoubtedly become a very valuable Museum. It is certainly desirable that the Museum may be made use of in connection with the Anthropological instruction of the University.

Although not properly falling within the scope of this paper, there yet remains to be mentioned what is, without doubt, the greatest center of Anthropological research in America. I refer, of course, to the city of Washington. With the extensive collections in the Army and Medical Museum, the National Museum and the Smithsonian Institution there is afforded unequalled facilities for the study of man. To the officers and assistants of the above mentioned museums and especially to the Bureau of Ethnology for their researches and encouragement, students of Anthropology are deeply indebted.

A rapid glance over what has been said reveals the fact that Anthropological studies of some sort are given in sixteen colleges while well organized departments of Anthropology are to be found in four.

Taking into consideration the fact that only recently has this science been recognized as a part of a college education abroad and in America, especially the ground which has been gained is considerable and furnishes much that is encouraging to American students of Anthropology.



# THE ARCHÆOLOGIST.

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**WARREN K. MOOREHEAD,**

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## EDITORIAL.

THIS number of THE ARCHÆOLOGIST is issued from Columbus, Ohio. There is hardly time to make a complete statement of the change in the Company, etc. But for the benefit and information of readers, advertisers and exchanges, the following facts are set forth.

The office at Waterloo is discontinued, and all business is to be transacted from Columbus, the new address being THE ARCHÆOLOGIST, Box 502, Columbus, O. Several new stockholders enter the company, among them the new business manager, Mr. H. T. Stephenson, B.Sc. Mr. Moorehead continues as editor. It remains an incorporated company.

The new company appreciates in a high degree the services of Mr. A. C. Gruhlke. He has been with the company since its organization in January, 1893. The growth and progress of the publication is due to his management and the personal interest he has taken in its success. While he severs his official connection, he remains interested in the welfare of the magazine, and will do all he can to aid its development. The present management is greatly indebted to him for his services, and certainly appreciates his good will and co-operation.

The Journal becomes the official organ of the Ohio Archæological and Historical Society.

This new step does not interfere with the publication of all articles sent us, nor does not change the form or character of the magazine. It enables us to print more pages than were issued in 1894 at the same price.

The Collector's Department continues, also Exchanges, Information for Collectors, Correspondence, and all other features of the past. The advertising rates are slightly raised because 1,000 copies more per month will be sent out in 1895 above 1894.

THE ARCHÆOLOGIST,

Box 502, Columbus, O.

All former contracts will be faithfully carried out.

PROFESSOR MCGEE, of the Bureau of Ethnology, is at present in the Southwest studying the Papagoes. He is accompanied by several assistants. This tribe is one of the few really wild Indian families left in the United States.

The tribe is largely self-supporting, raising corn, sheep, cattle and fowls. In some respects it resembles the Navajoes, although much smaller. It is fairly prosperous, as are most of the Indian nations who do not depend upon our governmental vascillating "spoils" system of handling our Indian wards. As Professor McGee and Mr. Dinwiddie are both competent scientific workers, much good may be expected of the expedition.

THIS is the last number of THE ARCHÆOLOGIST for 1894. It enters upon its third year with a series of most valuable and interesting papers to be presented to its readers from time to time. It has printed more pages (at one-fourth of the price charged by a certain Illinois publication, which is bimonthly) for less money than any other archæologic and ethnologic journal in the world. Its articles have been contributed by the recognized anthropologists of this country. While the publishers shall continue to present a fine journal in '95, at the same time they apprehend that the collectors, for whose sole benefit this magazine is run, are indebted to a certain extent. Readers may ask, "To what extent?" To the extent of securing other subscribers. The subscription list of the journal could be easily doubled if all readers would write or speak to other collectors whom they know. We have given you matter which would cost you, in book form, \$3 or \$4; will you not reciprocate and show your appreciation by sending the names of one or two new subscribers?

## BOOK REVIEWS.

Publications received. (Reviewed next month.)

- "Notes on Eskimo Traditions", from the Journal of the American Folk-Lore Society. By Harlan I. Smith.
- "Ninth Annual Report of the Ohio Archæological and Historical Society, 1894."
- "Journal of the Polynesian Society," Vol. III, No. 2, June, '94, Wellington, N. Z.
- "The Kinship of the Tusayan Indians," from the Anthropologist for Oct., '94. By J. Walter Fewkes.
- "The Monist," Vol. IV., No. 3, Chicago, April, '94.
- "As to Copper from the Mounds of the St. John's River, Florida." Journal of Academy of Natural Sciences, Phila. By Clarence B. Moore.

This work, to some extent a reprint from Part II, of "Certain Sand Mounds of the St. John's River, Florida," will be hailed with delight by those who have been interested in the study of aboriginal copper in America. While the book is largely descriptive of copper from Florida, there are analysis of Ohio, Canadian and other finds. The results may be safely accepted as final. To those of us who have had great faith in the extreme antiquity of the Ohio Valley mound copper, the analysis simply confirms our original opinions. To many of the gentlemen at Washington, who have steadily maintained that all mound copper was modern, traded to the Mound Building tribes by French and English and Spanish *coureurs de bois*, traders and adventurers, the results of the extensive work of Mr. Moore must be highly disappointing. Others in the same institutions who have correctly separated the modern from the ancient will be pleased and gratified.

Respecting his examinations, Mr. Moore says:

"Before proceeding to discuss the copper found in various mounds of the St. John's, we wish clearly to define certain terms as they will be used by us during the course of

this inquiry. Native Copper.—Native copper is metallic copper found in nature, often containing other elements, such as silver, iron, etc. Copper ores.—When copper is found in chemical combination with other elements it forms an ore, \* \* \* Melting and Smelting.—To melt is to reduce to a liquid state through the agency of heat. To smelt, is to recover the metal from the ore by the aid of heat, at times the employment of certain fluxes and the use of carbon in the case of copper. Thus it is clear that to aborigines conversant with the melting of copper, the art of smelting might be unknown.

"With one possible exception, a hawk-bell, a favorite gift and medium of barter from the time of Columbus, found with iron and glass near the surface of the mound, at Dunn's Creek, no article of copper distinctly of European workmanship has been met with by us in the mounds. of the St. John's. Articles of brass, of whose origin no doubt can exist, are of course not under consideration." He here refers to Prof. Cushing's admirable paper in the *Anthropologist*, which proves that difficult designs in copper and *repoussé* work can be done by native American workmen employing aboriginal tools. He says that good commercial copper of today is 99.5 per cent. pure, and copper of 99 per cent. is considered inferior. That in the 16th century in Europe smelting processes were not properly understood, and the per cent. of silver was very large. That old copper coins have recently been melted in Germany because of the large per cent. of silver due to imperfect smelting.

"The per cent. of pure copper in the native state is 99.65 to 99.994." \* \* \* Copper from Mt. Royal, Fla. (Mound): Copper, 99.897 per cent.; lead, none; bismuth, none; iron, 00.0057; gold, none; silver, 00.0012.

"They state that the sample was much corroded, and although cleared with acid before analysis, there was probably a little oxide remaining which they did not attempt to determine."

Fragment from the copper deposit in the famous Hopewell Group. Copper, 96.3100 per cent.; antimony, 0.0070 per cent.; silver, 0.0450 per cent.; nickel and cobalt, 0.0060 per cent.

Copper axe from W. K. Moorehead, Pickaway Co. Mound (Ohio). Gold, none; silver, 0.011 per cent.; lead, none; bismuth, none; copper, 99.678 per cent.

Considering the high per cent. of copper, the presence of a little more than a trace of silver and iron, the absence of lead, Mr. Moore has firm conviction of the great age of the mound copper.

"Incidentally, that mound copper from other localities, including the copper of the famous Etowah plates of Georgia, and of the no less well-known Hopewell mounds of Ohio, is, like the Florida copper aboriginal, having nothing in common with the products of the impure European sulphides and imperfect smelting processes of the fifteenth, sixteenth and seventeenth centuries."

There are several colored plates and many figures. All faithful students should possess a copy.

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"Life in Ancient Egypt," by Adolf Erman. Translated from the German by Helen M. Tirard. 565 pages, 400 illustrations and 11 plates. Macmillan & Co., N. Y. \$6.00.

No work, it has been said, since that of Wilkinson, presents in a more scholarly form the life of the ancient Egyptians than the volume before us. It is a summary of the explorations of Morgan, Petrie, Edwards, the Exploration Fund, personal observation, etc. It is a work of value to the student of Egyptology and the intelligent general reader. The only criticism one might offer is that the author has been scarcely considerate of the credit due to the workers in the Egyptian field. In fact, he scarcely mentions any of the names of the great workers in that intensely interesting and important land of ruins. This is hardly just, for it is to these men that



scholars owe their present extensive knowledge of ancient Egyptian life.

However, this censure need not apply to the work, but to the author. Beginning with the land of Egypt, and a description of its resources, people, etc., he traces the dynasties from first to last. The religions, arts, customs, pursuits, he tells about in the light of recent explorations. One need but compare his book with Wilkinson's to appreciate the wonderful progress in our understanding of the people of the Nile as they were twenty or forty-five centuries ago.

One of the most remarkable discoveries was that of the "Harris Papyrus." It was 133 feet long and contained 79 pages of very large size. It sums up the total gifts bestowed by Ramses III. upon his various gods, temples, etc., during his 31 years of reign. One cannot but be surprised at the extent of his beneficiaries. Imagine the wealth and power at his command if he gave, as the manuscript says, 493,386 cattle, 113,433 slaves, 1,071,780 plots of ground, 28,080 jars of wine, 460,700 sacks of corn, 1,075,635 amulets and scarabæi, and so on for pages. It is incredible! Yet, it must be true.

The work is most beautifully illustrated, the style clear and strong. It will grace any library.

W. K. M.

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"Studies in Biblical Archæology," by Joseph Jacobs. Macmillan & Co., New York, 1894. \$1.50.

These studies consist of seven short essays on various phases of Biblical Archæology, e.g., "Totem-clans in the Old Testament," "The Nethinim," "The Indian Origin of Proverbs, Chap. XXX," "Revised Old Testament," etc. Nearly all of them are reprinted from various periodicals in which they first appeared.

We fail to see that this volume contributes any valuable knowledge as to the early social state of the Hebrew people, or that it furnishes any light whatever as a

help to the solution of certain Old Testament problems. On the slenderest hints and most untrustworthy allusions in the Bible, Mr. Jacobs, and those who hold with him, are disposed to found their extra-biblical theories as to the origin of the Israelitish commonwealth and religion. Mr. Jacobs poses as a higher critic of the rationalistic school, is, we fancy, an agnostic. His one sole object seems to be to eliminate as far as he can the supernatural element from the Bible, and to bring down the Hebrew originals to the level of all heathen systems. Evolution is his solution of all the complex phases of human history. The Bible, Mosaism, Christianity, in short, everything belonging to our planet, is the outcome of slow but sure evolutionary processes. Like the other excessively proud and arrogant critics of the "scientific method," Mr. Jacobs seems to encounter no more difficulty in the phenomena of the Hebrew people and the Old Testament than in an apple dumpling! To some enquiring minds there might be some question as to how the apples got into the dumplings—how the Hebrew people and their Bible came to be as they are, totally different from all other people and books—Mr. Jacobs, apparently, encounters none.

In his essay on "The Nethinim," the author endeavors to trace their origin from women whom he designates as "the sacred prostitutes in connection with the Temple of Jerusalem!" The proof? The proof submitted is such as would not be entitled to a moment's consideration in the lowest court on earth. Think of such stern and unflinching reformers as Ezra and Nehemiah, who did not halt an instant to separate husbands from foreign wives with whom they had lived for years, who turned out of the Temple precincts, bag and baggage, Tobiah the Ammonite who had been tolerated there by Eliashib the guardian of the Temple, (Neh. xiii: 7, 8), engaging the Nethinim as servants of the house of God if they were such as Mr. Jacobs conjectures! But when a man has a pet theory,

a lovely theory—must he not nurse it tenderly? But suppose the facts are against the theory? "So much the worse for the facts."

W. G. M.

"North American Bows, Arrows and Quivers," Smithsonian Report, '93. 175 plates and pages. By Otis Tufton Mason. Washington, Government Printing Office.

Professor Mason's valuable contribution to American Ethnology is the result of his many years of study. With the enormous National Museum collection at his command, he has had superior advantages, and his new work shows that he has availed himself of them.

He adopts M. A. de Mortillet's scheme of classification, slightly modified to fit the

weapons of the North American Area. He quotes from much of the literature of the subject. He classifies bows as follows:

Self bows made of a single piece. Of these the horns may be separate.

2 Backed bows	{	with sinew	{	in a cable.
				Called sinew corded bows.
3 Compound.	{	with meneer—many kinds.	{	glued on.
				Sinew lined bow.
				wrapped about. Seized bows.

The plates are exceptionally good. By his study of bows the Professor finds each tribe has its peculiar form, and that widely separated sections of the country present bows different in both material and make.

## COLLECTOR'S DEPARTMENT.

### PITTED HAMMER-STONES.

In the preceding number of THE ARCHÆOLOGIST Prof. H. C. Mercer says: "We hesitate to infer that a pitted hammer-stone is always a stone carver's tool, and that its discovery is proof of neolithic culture." In this opinion I fully concur. In the first place, the division of European stone implements into Paleolithic and Neolithic has always appeared to me to be arbitrary and unscientific; and the attempted application of this classification here to similar remains of the aboriginal American race is, in my view, unwarranted nonsense, for it assumes the existence here of a pre-Indian race so little removed above the brute in intelligence as to be capable of employing only sticks and splintered stones as mechanical aids in the struggle for life. And this postulate necessitates the abandonment of the

generally accepted monogenetic theory of man's origin, and substitutes for it the unavoidable inference that a special creation of ape-like human beings occurred on this continent; that this chimerical "paleolithic" people achieved no improvement or progress in the domestic arts, for only the rudest, shapeless stones, scarcely worthy of being called *implements*, are attributed to their authorship; that they were contemporary with the great sloth, the mammoth and mastodon, and with rough fragments of argillite as their only weapons, hunted the cave bear and sabre-toothed coryphodon in the fastnesses of New Jersey; that in time they were overtaken by the advancing northern glaciers and mercifully extinguished. Then followed a long hiatus in the human occupancy of this hemisphere, broken at last by the coming of the equally mythical pre-Indian Mound Builder, with

his high civilization and splendidly organized empire!

Seriously, the idea of pre-glacial man in America is consistent only with the poly-genetic hypothesis of creation, and such a being as the imagination depicts him, must, in the nature of things, have been an autochthon. But if man in America is an exotic, as is generally believed, and migrated from Asia, either overland or by water, he could not possibly have undergone the frictions and attritions of such a journey without having had *ab initio*, or gained by experience very considerable proficiency in the art of working stone and other materials. No people equipped with only such crude appliances as are credited to the pre-glacial race, here or in Europe, could have survived the obstacles encountered in moving such vast distances. There is no parallelism between the migrations of animals and man. Nature is generous to the one and obdurate to the other. It provides lavishly for all the wants of animals while in transit, but migratory primitive man was compelled to wrest from it safety and subsistence by force of his ingenuity and skill, and success depended altogether on his developed fitness.\* In the next place, I have never seen a tenable reason advanced for believing a pitted stone hammer to be any part of a stone carver's outfit.

Professor Mercer's experiment in making "an axe groove around a hard sandstone pebble, with a trap boulder and a quartzite hammer-stone in about an hour, striking with the latter near 190 blows to the minute," proves only that he could have accomplished the same result with fewer blows had he used sharp-pointed pieces of quartz instead of a rounded one. There is no reason to believe that axe grooves were made with pitted hammer-stones. Any collection of diorite or greenstone implements as mine, comprising some 300 grooved implements and as many ungrooved, contains

specimens in all stages of completeness by which we can trace, with a moderate degree of certainty, the method and means employed in their manufacture. We see the initial step was the selection of an azoic drift boulder approximating the designed implement in form and size, or securing such a fragment by breaking up a larger mass. This piece of raw material was then placed on a boulder anvil and further reduced to the required shape with other hard stones used as hammers. It was then *pecked* down to its final proportions with *pointed* pieces of flint or quartz. In this stage the object has received its ultimate form and symmetry, but is rough and uniformly pitted all over, groove and all. It was then finished by rubbing with, or on, other stones, probably with the aid of water and fine sand. In no part of this process is the employment of pitted hammer-stones necessary or in any way applicable. That they were intended as tools to aid in manipulating objects made, or carved, from hard, primitive rocks, I think is improbable for the following additional reasons: The Indian was not so prodigal of labor, nor had he that conception of mechanical adaptation, to impel him to make pits in a pebble merely for facility in grasping it, when a stone without pits picked up anywhere would have answered his purpose as well. We know his characteristics too well to believe that he would have modified a pebble that required him to strike 190 blows to the minute to accomplish anything. The pitted hammer-stones are largely drift pebbles of soft formations, as sandstone, steatite, slate, argillite, etc., totally unfitted for hammering hard granite rocks. Many of them are pitted only one side, and a large proportion of them have no abrasion of their periphery whatever.

With me the chronology of pitted hammer-stones has never been a factor of value in determining their probable use, and without stopping to solve the abstruse problem of their worth as evidence of paleolithic or neolithic culture, I, many years ago, was

\*I have attempted to elaborate this argument in a paper on "An Illinois Drift Implement," read before Section H of the A. A. S., at its Brooklyn meeting last August.

convinced that they were nothing more than nut crackers. Their indentations, or pits, worn by long continued percussion, clearly indicate their purpose, independent of the fact that they are invariably found about the sites of old Indian camps in nut-bearing regions. Some have battered and broken edges, proof that in breaking the larger nuts that part of the stone was brought in requisition, or that it was frequently so used as an ordinary hammer in other exigencies.

This view of the object and origin of pitted hammer-stones is based not only on the intrinsic and extrinsic evidences of the indented pebbles, but on personal observation and experiment. In the home of my French ancestors, near the banks of the Mississippi, just below old Cahokia, three quarters of a century ago there was brought a smooth, water-worn trachyte pebble weighing nearly a pound, that was picked up from the boulder clay of the bluffs, and used for two generations, as neighboring Indians used similar pebbles, in the capacity of a nut cracker, with a large boulder for a basal or lap stone. Besides its service in cracking pecans, hazelnuts, walnuts and different kinds of hickory nuts, that stone was often made to do duty as a common hammer in driving tacks, nails, etc., so that after those long years of faithful servitude, deep indentations were worn in both its sides, and its edges are roughened and uneven. It is to-day among several other pitted hammer-stones in my collection that were gathered from old Indian haunts from Oregon to Georgia, attesting, perhaps, the status of neolithic culture, and will baffle the skill of the most expert archæologist to distinguish it from its prehistoric associates.

J. F. SNYDER, M. D.

Virginia, Ills.

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*Editor of THE ARCHÆOLOGIST :*

I have in my collection a cache of 96 chipped implements, double pointed and beautifully wrought. The shortest is four inches and the longest eight and one-half inches. I would like to know their special

use. They are less common than other forms and I have only seen a very few and those in the Anthropological Building at the World's Fair. I write you this note after reading your editorial note on the importance of keeping together caches of such interest. I have been repeatedly urged to dispose of a part of them, but have put a greater value on them collectively than could be realized otherwise. I have them nicely mounted on a plush covered card, and intend to have them framed.

Yours truly,

DR. DANIEL B. FREEMAN.

*Chicago, Oct. 9, '94.*

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### **The Origin of Death, According to a Legend of the Ochehamnes Indians of the Sacramento Valley, Cal.**

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The following legend concerning the origin of death was obtained from Yavorino, who is probably the last member of the Ochehamnes tribe of Indians, which occupied the east side of the Lower Sacramento River. Yavorino is said to be 107 years of age. He speaks no English, and but little Spanish, hence it was with great difficulty that the story was obtained. Mr. E. Munyan, of Newark, Cal., persuaded an Indian to interpret it from the Indian to the Spanish, when he wrote it down, and afterwards translated it to English. Mr. Munyan is a scholarly gentleman, and his veracity is beyond scrutiny. He gives the legend as follows:

"When the world was new, Huile was the greatest chief of the River Sacramento, and also of all birds, ducks and animals. Humne was the big and hollow-headed god that had his head on the outside adorned with long strings of feathers, which he was continually pulling out and spreading on the water. Humne made a raft of bull-rushes one day, placed a man on this raft, and floated it down the river, going from side to side, until he came to where there was a woman on the bank.



This woman was a sister to the great chief of the beavers.

"Humne had painted her face, arms, breast and limbs. Humne ordered a man to speak to her. The man spoke, but received no answer. He then floated across the river, when Humne ordered him to return and speak again. This time there was no reply. He ordered him to speak again. The woman then invited him to come into the hut. After entering the hut, he heard two children cry; they were grandchildren of Blue Heron. After being seated for a time, he commanded the woman to bring water in a *cora* to bathe his lips. She took the *cora* and went to the river, and dipped it full, and carried it to him. He took it, and looked at it. He saw a dead adder, and, after looking at it, he asked why she made sport of him. He then directed her to get clear water. She threw it out, and reached farther into the river, and filled the *cora* and brought it to him. He saw a great rattlesnake coiled in it. He asked her why she made sport of him, and brought a serpent. He asked her to throw it out and bring him water.

"She took the *cora* and threw out the snake. She reached farther into the stream to get clear water, which she carried to the man. He took it and saw, instead of water, it was a huge toad that she brought. He said: 'Why bring me a reptile when I ordered water? Go bring me water.' She went forth and reached farther still into the stream, filled the *cora*, and returned. This time it was filled with frogs. He then, in a rage, took a club and killed her. Not knowing that she was dead, he seated himself by the body until morning, when the black bird came and began to cry. He killed it in his anger, and tore it to pieces, and scattered it to the four points of the compass, when each fragment began to cry. Then the meadow-lark cried, and the turtle cried, and the great blue heron came, and with strong beak tore his flesh, and then he cried.

"After crying all day, he gathered dry sticks, and made the funeral pyre, and and burned the woman's body, and gathered up the ashes in a *cora* and threw some of the ashes to the four points of the compass; and throwing a handful into the river, he rubbed the rest over his body, and returned to the hut. This was the beginning of death in the world, as told by Yavarino, a California Indian, and one of the last of his once numerous tribe."

In the early part of the present century, the Ochehamnes Indians were captured and brought to the Mission San Jose. At that time they were quite numerous. This tribe practiced cremation, and after the bodies of the deceased had been reduced to ashes, they covered their bodies with the same. During the process of cremation, the men applied the fagots and stirred the fire, at the same time placing the personal effects of the deceased in the fire with them. The women tore their hair and lacerated their faces with sea shells. They kept up the death-cry for several days, when the whole tribe met and wept in harmony to bring about happiness again.

GEORGE J. REMSBURG.

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Editor of THE ARCHÆOLOGIST :

DEAR SIR:—Have just returned from a trip to the western part of this State; there have been some good finds there within the last year or two. There was one of much interest near the outlet of Kershong Creek town of Seneca, Ontario County. While excavating for foundation for one house, there was a cache of about 300 flint knives found from 3 to 4½ inches long, finely wrought; one specimen of which I secured and send you with this. There were many graves at this place from which many pipes, kettles, axes, etc., were obtained. Most of the graves had been opened, but I found three. No. 1, the head had been disturbed but at the feet was a perfect brass kettle and axe of English make. This was about one foot deep but the surface had been scraped off, so I

could not get the actual depth from the original surface. This was six feet long, the skeleton laying on its back. No. 2, a young person, bones much decayed. This was 5 feet long, skeleton on the back; pipe stem near top of grave, bowl of pipe at the feet, both the same pipe; three catlinite beads around the neck.

No. 3, 1 foot from present surface; skeleton on right side; knees near the chest; bones much decayed; remains of brass kettle; no other relics.

From there I went to Mr. Hazelet's, about 6 miles from there, where, on a previous trip, I had found some fine catlinite beads. We spent two or three hours digging but found nothing. Here have been found catlinite beads with Indian and negro faces carved on them, five of which I have seen.

Then, I visited a place near Lima, where in excavating for a railroad, there were many graves found in which were many catlinite beads, brass kettles, guns, iron axes, etc. As soon as I got home, I excavated on land owned by Mr. Donald Judson, one mile north of this village. Here we found one grave only, 1 foot deep at the head, while the feet were 1½ feet deep, being so near the surface, the bones were all broken up with the frost and the treading of animals. In this we found a quantity of iron ore. This had been obtained to make paint of, but had not yet been ground up. On the 3d and 4th of April, 1888, within a few feet of this grave, I found several pounds of paint made from iron ore.

There have been other interesting finds in this part of the State, that the finders have agreed to let you know about; if they do not report them, you may hear from me again.

Yours truly,

WM. W. ADAMS.

### RECENT DISCOVERIES.

Valuable copper chisels have recently been found in Wisconsin, the largest being fourteen inches long.

Mr. W. L. Calver, of New York, has exhumed several axes and pipes on Manhattan Island. He considers them of great antiquity.

In Alameda (California) mounds, were recently discovered mortars, pestles, tubes, pipes, arrow-heads, pendants, etc. Unfortunately, the finds were distributed among local curiosity hunters, and there seems to have been no accurate account kept.

The *Herald* of Chicago prints from the *Kansas City Star* a singular article. It is to the effect that "The American Indian has done nothing to benefit mankind," and "He will leave nothing behind him to mark the place he occupied in the world—no history; neither monument." What rot. Indian corn alone (of the many things he has left us) is worth more than \$1,000,000,000 a year to the world. Kansas, owing the Indian for her chief industry, should be the last State to make such a statement. And, moreover, what degradation the *Star* claims for the American race is due entirely to Europeans. As to the monuments, we need only refer the editor to upwards of 25,000 earth and stone mounds and fortifications of the Mississippi Valley (to say nothing of the Southwest), where they have stood for ages, and where they will continue. No history! Did the *Star* ever hear of Logan, Massasoit, Tecumsch, Brandt, Pontiac, Cornstalk, Joseph, Red Jacket, Red Cloud, Sitting Bull, Osceola, Black Hawk and others?

### A MASTODON SKELETON.

The skeleton of one of the largest mastodons ever found in North America is being reconstructed and mounted at Ward's Natural Science Establishment in this city. The massive anatomy of this progenitor of the elephant was found about one year since in Clark County, Ohio, fifty miles from Columbus, in a swampy locality, by Mr. Moorehead of the Ohio State University. When completed it will be returned to Dr. Orton. It is a peculiar fact that

in nearly every case the remains of these mammoths are found in places of a swampy nature, where they had evidently become mired and were unable to extricate themselves. Like the elephant, they subsisted almost entirely on the lighter foliage of trees and undergrowth. This was quite clearly demonstrated some time since in the discovery of a mastodon in this State, in which case the interior of the skeleton contained a mass of decayed matter of a botanical nature.

The skeleton of the mastodon now being mounted by Professor Ward was well preserved when found. The skull was practically perfect, and the jaws and teeth were intact, until some of the farmers in the locality became interested in the discovery to such an extent that they unscientifically extricated several with the aid of a pick-axe, thereby damaging both the teeth and jaw, to the great disgust of the discoverer. They have been reclaimed, though, and are at present being replaced. The skull is about three and one-half feet in length and three feet in diameter. The weight of each jaw bone is about 150 pounds, and they resemble a huge horse collar, being about three feet in length and two feet across. Each jaw contains six teeth, three on a side, all molars. The front ones are the smallest, having a surface of about six square inches, or three inches in length and two inches wide, while the second and rear ones are five and seven inches in length, respectively. Occasionally small tusks are found in the lower jaw, but these cases are rare. The teeth are rooted in the jaw bones similar to those of a human being, but it is a strange, although authenticated fact, that in life the end of the front teeth is worn away, and the others move forward to make room for a new one, which always appears at the rear. How this change took place without producing great pain and inflammation has never been explained, although the same change is undergone in the teeth of the elephant.

The tusks, which are usually the source

of greatest interest and wonder to the public, are nine feet and three inches in length and about ten inches in diameter at the root. Neither of them was broken.

The vertebral column is ten feet, five inches in length, and is eight inches in diameter at thickest point. The sacrum is one foot and two inches long, and the skull being three and one-half feet in length, places the entire length of the animal from forehead to root of tail at fifteen feet and one inch.

Including his length to the tip of his tusks, which are nine feet three inches, and allowing two feet for the length of the tail, which is usually short, this giant's length over all would be twenty-six feet, four inches. One of the larger rib bones was found to be four feet and seven inches in length, while the humerus, or upper bone of the foreleg, was three feet in length and three feet three inches in circumference at the end. The shoulder blades are not exceptionally large in the mastodon, and do not correspond with the rest of the anatomy.

The width of the pelvis is five feet seven inches. A plaster cast is being made of this, and will be retained for use in case at some future time another skeleton is secured in which this part is missing. The femur, or thigh bone, measures three feet nine inches in length, and its weight is about ninety pounds. The head of this bone, which fits into the socket of the pelvis bone, is seven inches in diameter. In the skeletons of all animals but the mastodon and elephant, these ball and socket joints retain their position by means of ligaments, while in these mammoths the ligaments are missing, and the bones are held in place through atmospheric pressure; that is, the surface of the ball at the end of the femur is so large and being hollow, forms a vacuum sufficient to hold it in place. Only one of these femur bones was found by Mr. Moorehead, and a duplicate is now being constructed by one of Professor Ward's employes. A rough core of wood is first made after which it is modeled in papier mache.

Henry L. Ward, through whose courtesy the reporter was allowed to secure the dimensions of the mammoth, stated that it would require three months' time of five or six experienced workmen to complete the reconstruction and mounting of the skeleton.

The total weight of the skeleton sent by Professor Ward to the World's Fair was 1,800 pounds, and this one being somewhat larger will probably weigh in the neighborhood of one ton.

### REMAINS OF MOUND BUILDERS.

BROOKLYN, IND., NOV. 18.—On the farm of Joseph Newby, two miles north of this place, is a beautiful mound covered with large trees. The mound, it has always been supposed, was built by the Mound Builders, but an investigation was never made. Yesterday it was opened, and two skeletons were unearthed, the bones of which were mostly in a fair state of preservation.

Anthropologically considered, what an enormous strain there must be on the man, as an animal, when exposed to the wild changes of temperature which he experiences in the twenty-four hours when living on the high Thibetan ranges. There is not a night in the year that water does not freeze, while at midday the heat is often 120°. We know about what is the increase or decrease of iron in length and bulk with every rising or falling degree of the thermometer. We are aware, too, that a certain disintegration must follow. After all, it is man that has the greatest power of initial resistance.

### WANTED.

A few complete sets of Vol. I of THE ARCHÆOLOGIST, for which we will pay \$1.25 per set, or will pay 15 cents each for the first four numbers.

THE ARCHÆOLOGIST PUB. CO.,

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### EXCHANGE DEPARTMENT.

Exchange notices pertaining to Archæology, not exceeding 35 words, will be inserted free for all regular subscribers. Dealers are referred to our regular advertising-rates.

A large German serving tray of 1799, valued at \$25. A fine Grandfather's clock, 8 feet high (made in 1765) in good condition and valued at \$100 to exchange for Indian relics or cash. W. K. Moorehead, Box 502, Columbus, O.

Some very valuable banner stones, ceremonials, gorgets, etc., for sale cheap. Warren Cowen, Elmville, Highland County, Ohio.

Rare Indian relics from Connecticut and Rhode Island to exchange for Columbian stamps above two cents; also other desirable U. S. stamps. Mine are first-class goods and I expect the same in return. All letters answered. Lock Box 21. Stonington, Connecticut.

Arrow points, scrapers, knives, large pieces of pottery, minerals, fossils, fresh water shells, quartz crystals, grape vines, bulbs, flower seeds, etc., for arrow points, spears, Minerals, etc. Arrow points especially desired from Alabama, Florida, California, Colorado, Iowa, Maryland, Delaware, Dakota, Utah. G. E. Wells, Manhattan, Kansas.

I have 6th, 8th and 9th Annual Reports of Bureau of Ethnology; 9th U. S. Geological Survey; 1889 and 1890 Contributions to North Am. Eth.; 15th, 16th and 17th Indiana State Geological Reports; all cloth and new. Want in exchange Vol. I. of the ARCHÆOLOGIST, State Geological reports, Geological and Ethnological literature. Charles Clickner, Tangier, Ind.

A bargain in relics. 400 arrow-heads, 8 good celts, 1 good hammer-stone, 1 fine large size grooved ax, all for only \$10.00 cash, or will exchange for clean U. S. Fractional currency. C. E. Tribbett, Thorntown, Ind.

One breach-loading flint lock rifle; also one Prussian rifle cap, powder and ball. Want flint lock pocket pistols in good order or cash. Davis Bros., Diamond, Ohio.

Wanneta, the Sioux; Primitive Man in Ohio; Fort Ancient; Cassino's Directory of Scientists; The Mound Builders; for Indian relics. All in good condition. W. K. Moorehead, Box 502, Columbus, O.















